Evens and Odds

You probably know what even and odds are. If you can split a pair of numbers in equal piles than they are even. If you have one left over, it is odd.

The even numbers are: 2,4,6,8,10,12,…..

The odd numbers are : 1,3,5,7,9,11,13,…..

Number patterns are also helpful in mathematics. Knowing how to count by a certain number is helpful for multiplication facts.

Counting by 3's

3,6,9,12,15,18,21,24,27,30

Counting by 4's

4,8,12,16,20,24,28,32,36,40

Counting by 5's

5,10,15,20,25,30,35,40,45,50

Counting by 6's

6,12,18,24,30,36,42,48,54,60

Counting by 7's

7,14,21,28,35,42,49,56,63,70

Counting by 8's

8,16,24,32,40,48,56,64,72,80

Counting by 9's

9,18,27,36,45,54,63,72,80

Counting by 10's

10,20,30,40,50,60,70,80,90,100

Don't look at your previous page and fill in the charts with the proper numbers. If you have any problems, practice them. Mark the ones that you struggle with to let your teacher know.

List the even numbers, starting at 2:

List the odd numbers, starting at 1:

County by 2's:

County by 3's:

Count by 4's:

Count by 5's:

Count by 6's:

Count by 7's:

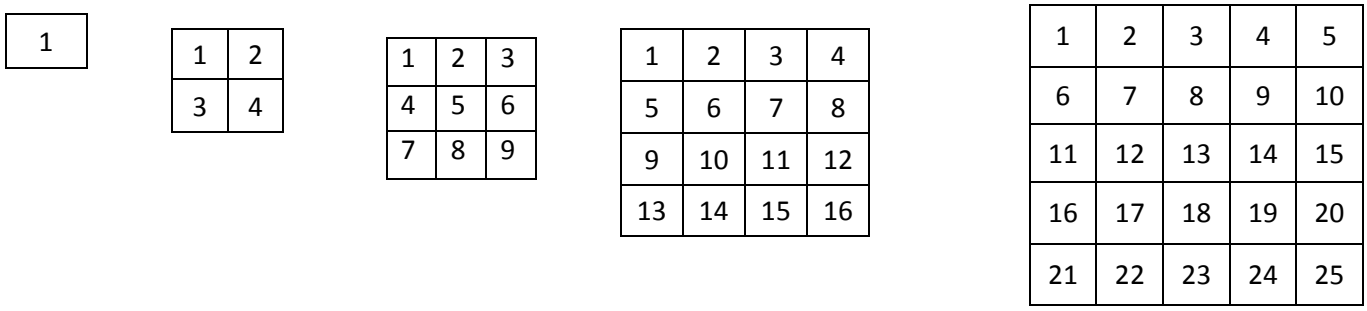
Count by 8's:

Count by 9's:

Count by 10's:

Square numbers

A good visual for square numbers are squares!



You get a square number by multiplying a number by itself. So knowing the square numbers is helpful for multiplication.

Practice these today:

2x2=4 3x3=9 4x4=16 5x5=25

6x6=36 7x7=49 8x8=64 9x9=81

10x10=100 11x11=121 12x12=144

Composite numbers

The word composite means that the numbers are "composed" of smaller numbers. For example, the number 10, is composed of 5 and 2. Which means when you multiply them together you get 10. Here are the composite numbers between 1 and 20:

4 6 8 9 10 12 14 15 16 18 20

Prime numbers

The other numbers are called prime numbers. Which means they can ONLY be multiplied by 1 and itself to make the number. You cannot multiple two different numbers to get it. The prime numbers from 1-20 are:

2 3 5 7 11 13 17 19

Now you know that every number is either PRIME or COMPOSITE. The ONLY exception is 1. It is neither prime nor composite.

Telling the difference between numbers and digits

A DIGIT is a single numerical symbol, from 0-9. A NUMBER is a string of one or more digits

For example, 8 is both a digit and a number. However, 22 is a string of two digits so it's a number—a two digit number. 587 is a three-digit number.

Place value

Individual digits when used in a combination help you build numbers. Place value assigns each digit a greater or lesser value depending upon where it appears in a number. Each place in a number is TEN TIMES greater than the place value to its immediate right.

Although the digit 0 adds no value to a number, it can act as a placeholder. When a 0 appears to the right of at least one non-zero digit, it's a placeholder. Placeholders are important for giving digits their proper place value. When a 0 isn't to the right of any nonzero digit, it's a leading zero. Leading zeros are unnecessary and can be removed from a number.
For example: in the number one hundred two: 102----zero is a placeholder in the tens place.

For example: when we write the number one hundred forty two. We don't need to write it **0142.** We write it **142.**

Here is a chart to show the place value of numbers:

millions			**thousands**			**ones**		
hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

Practice:
Place the number 7,521 in the table to show the value of the digits. Then write the number in expanded form. For example the expanded form of 432 is 400+30+2=432 That shows how you form the number.

millions			**thousands**			**ones**		
hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

expanded form:_____

Place the number 040,120 in the table to show the value of each digit. The use the table to show how this number breaks down digit by digit. Which 0s are placeholders and which are leading zeros

millions			**thousands**			**ones**		
hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

expanded form:_____
circle the zeros which are placeholders. Place a square around the leading zeros.

Place the number 432,334,760 in the chart to show the value of each digit:

millions			**thousands**			**ones**		
hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

Now write the expanded form of this number to show how it is formed:

_____

_____

Circle the COMPOSITE numbers—the numbers that are "composed of two other numbers"

1 2 3 4 5 6 7 8 9 10 11 12 13

14 16 17 18 19 20

Answer the SQUARES of these numbers:

2x2= 3x3= 4x4= 5x5= 6x6= 7x7=

8x8= 9x9= 10x10= 11x11= 12x12=

Reading long numbers

When you write a long number, you use comma's to separate periods. Periods are simple groups of three numbers. They make long numbers more readable. For example, here is a long number: 245,456,754,777,753,986,301

Here is a larger version place value chart

quintillions	quadrillions	trillions	billions	millions	thousands	ones
245	456	754	777	753	986	301

When you read it, you start on the left and says: "two hundred forty-five quintillions, four hundred fifty-six quadrillions, etc.

When you read and write whole numbers, don't say the word "and". In math the word "and" means decimal point.

In the number 8,432 identify the following numbers:

The ones digit_____

The tens digit_____

The hundreds digit_____

The thousands digit_____

Add commas to the correct places on the following numbers:

367870201000218 543789543234865 65437653323

Place the following number in the chart: 453,220,000,501

millions			**thousands**			**ones**		
hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

Now write the expanded form of this number to show how it is formed:

_____

_____

What is the VALUE of the 9 in the number 432,398,000? _____ if you are still stuck---how much is the 9 worth? Hint—which place value is it in?

What is the value of the 2 in the number 345,470,203?_____

What is the number for
400,000+20,000+9,000+700+40+4=_____

What is the number for
500,000+20,000+1,000+800+8=_____

What is the number for
400,000+9,0000+8?_____

What is the number for 500,000,000+20,000,000+3,000+40=

_____

Count by 3's

Count by 4's

County by 5's

count by 6's

count by 7's

count by 8's

Rounding numbers

Rounding numbers makes long numbers easier to work with. To round a two-digit number to the nearest ten, simply bring it up or down to the nearest number that ends in 0.

When a number ends in a 1,2,3, or 4 bring it down. Keep the tens digit the same and turn the ones digit into a 0.
When a number ends in 5,6,7,8, or 9 bring it up; add 1 to the tens digit and turn the ones digit into a 0.

When rounding a larger number, the method is the same. Focusing on the place value that you have to round and then look to the right and decide. If the number is 5 or more you round the place value up and the rest is zero. If it is less than five the number goes down to the nearest place value you are rounding.

583 rounded to the nearest hundred. The 5 is what you are rounding. It is in the hundreds place. Look to the right---the 8. It is more than 5 so the number 5 in the hundreds place goes up to the next hundred. 600

432 rounded to the nearest hundred. The 4 is what you are rounding. It is in the hundreds place. Look to the right—the 3. It is less than 5 so the number 4 in the hundreds place stays the same and the rest are zeros. 400. **Remember don't go down and skip a whole hundred by choosing 300---it is easy to think to go down but to go down to 400 is going down. 432 is in between 400 and 500.

Round the following to the nearest ten:

31_____ 58_____ 77_____

Round the following to the nearest ten:

742_____ 54,987_____ 2,921_____

Round the following to the nearest ten:

29	
43	
75	
93	

11	
58	
99	
82	

293	
439	
757	
939	

Round the following the nearest hundred:

439	
432	
788	
9,964	

639	
4,852	
79,588	
911,964	

439	
4321	
78,822	
199,642	

Okay, do you think you have those? Check your answers before moving on and then do the rounding by thousands at the bottom of this page

Round to the nearest thousand:

5,280	
88,888	
1,234,567	
180,342	
222,565	
874,326,444	

Addition

This will be a pretty easy review for you this week. This is going over the basics of math. When you add to numbers together the answer that you get is the sum. Addend plus the addend is the sum. Just some terminology for life☺

Do this first page and have your teacher check it and then if you have them all correct, you don't have to do the second page. The second page just works on the same problems again in case you missed them.

55 31 +12	376 49 +12	5553 3231 + 812

Add 35+26+142=

Stack the numbers and add the columns from right to left

What is the sum of the following numbers: 50,40,30,20,10,8,6,2?

See if you can add some of the numbers in your head. Use the space below for your work if needed

Add 5,235+4,926+142=

Stack the numbers and add the columns from right to left

More help ONLY if you got the first page wrong

85
53
+12

786
52
+92

3785
3931
+ 872

Add 55+86+842=

Stack the numbers and add the columns from right to left

What is the sum of the following numbers: 60,40,70,30,2,8,6,4?

See if you can add some of the numbers in your head. Use the space below for your work if needed

Add 8,235+4,936+72=

Stack the numbers and add the columns from right to left

Subtraction

This will be a pretty easy review for you this week. This is going over the basics of math. Subtraction is all about who has more or less. When you subtract one number from another you get the difference. Remember you can't take away more than you have. You may need to borrow in some of these problems.

Do this first page and have your teacher check it and then if you have them all correct, you don't have to do the second page. The second page just works on the same problems again in case you missed them.

386 -54	386 -94	1, 006 - 198

Subtract 874-85.

Remember you will need to stack
the numbers and line them up properly.

Subtract 42,041-5,869.

Remember to show your last page to your teacher, if you get them all correct, there is no need to do this extra page. This is just for additional practice.

476 - 64	386 -78	2, 003 - 198

Subtract 754-85.

Remember you will need to stack
the numbers and line them up properly.

Subtract 41,041-5,539.

Multiplication

This operation is a lifesaver when you need to know the amount for multiple things. Let's say you need to buy 4 drinks for your 6 brothers and sisters. How many do you need? You can add up all the drinks among all of your brothers and sisters or you can quickly say 4 times 6. 4x6=24.

When you multiply two numbers, the two numbers that you multiply are called factors, the result is the product

When you were first introduced to multiplication you used the times sign (x). However algebra uses the letter x a lot, which looks similar to the times sign, so people often choose to use other multiplication symbols for clarity.

Some use a dot like in the following:

$4 \cdot 2=8$ means 4 x2=8

In some math, they use parentheses like the following:

3 (5)= 15 means 3x5=15

(9)(10)=90 means 9x10=90

However, notice that when you place another operator between a number and a parenthesis, that operator takes over. For example:

3 + (5)=8 means 3+5=8

(8)-7=1 means 8-7=1

$(9) \cdot (10)=90$ means 9x10=90

Memorizing math facts is soooooooo important. Do this at extramath.org to practice every day until you get it.

Remember that the" zeros" are easy. Any number times zero is zero.

Any number multiplied times one is that number.

Twos and fives should be fairly easy as well.

Practice filling in the next page as quickly as you can.

3	9	4	8	5	7	6
x3	x3	x3	x3	x3	x3	x3
9	8	7	6	5	4	3
x9	x8	x7	x6	x5	x4	x3
7	8	9	8	7	6	6
x6	x9	x7	x7	x7	x8	x9
7	6	5	8	4	4	5
x5	x5	x5	x5	x5	x4	x9
6	8	5	3	7	9	4
x3	x3	x3	x3	x3	x3	x3
10	11	12	9	8	7	6
x10	x11	x12	x9	x8	x7	x6
5	4	3	2	1	4	3
x5	x4	x3	x2	x1	x7	x6

Repeat this just like yesterday, you should be able to go fairly quickly.

3	9	4	8	5	7	6
x3	x3	x3	x3	x3	x3	x3
9	8	7	6	5	4	3
x9	x8	x7	x6	x5	x4	x3
7	8	9	8	7	6	6
x6	x9	x7	x7	x7	x8	x9
7	6	5	8	4	4	5
x5	x5	x5	x5	x5	x4	x9
6	8	5	3	7	9	4
x3	x3	x3	x3	x3	x3	x3
10	11	12	9	8	7	6
x10	x11	x12	x9	x8	x7	x6
5	4	3	2	1	4	3
x5	x4	x3	x2	x1	x7	x6

Add the following numbers 36+234+4,125. Write them in column form

Subtract the following numbers: 4,287-399.

Find the sum of 4, 16, 22, 256,268, and 8.

Find the difference between 763 and 854.

Subtract 432,876-3,098.

The reason we learn the math facts is so that you can more easily multiply larger numbers. Practice this page and have your teacher check it. If you get them all correct, you do not need to do the next page.

55
x4

78
x7

125
x9

654
x5

542
x21

598
x86

754
x128

802
x512

Remember do this page ONLY if you missed ANY of the last page.

77
x3

32
x9

864
x3

798
x5

632
x72

987
x28

902
x121

505
x511

Multiple 75˙42

Multiple 136˙84

Multiple 1,728˙405

Multiple 325˙11

Do this page ONLY if you missed any of the first page

Multiple 62˙42

Multiple 176˙85

Multiple 3,528˙402

Multiple 925˙11

Division

Division is the last of our four operations. Long division moves from left to right. For each digit in the divisor , the number you're dividing, you complete a cycle of division, multiplication, and subtraction.

In some problems, the number at the very bottom isn't a zero. In these cases the answer has a remainder, which is a leftover piece that needs to be accounted for. In those cases, you write "r" by whatever number is leftover.

Divide 956 ÷4.

Start off by writing the problem like this:

```
4⟌ 956
```

To begin, ask how many times 4 goes into 9, that is what's 9÷4? The answer is 2 (with a little leftover), so write 2 directly above the 9. Now multiple 2 ·4 to get 8, place the answer directly below the 9, and draw a line beneath it:

```
   2
4⟌ 956
  -8
```

Subtract 9-8 to get 1. ***Remember after you subtract, the result should be less than the divisor (in this problem the divisor is 4). Then bring down the next number (5) to make the new number 15.

```
   2
4⟌ 956
  -8
   15
```

These steps are one complete cycle. To complete the problem, you just need to repeat them. Now ask how many times 4 goes into 15—that is, what's 15÷4? The answer is 3 (with a little leftover). So write the 3 above the 5 and then multiply 3·4 to get 12. Write the answer under 15.

```
  23
4⟌956
 -8
  15
 -12
```

Subtract the 15 -12 to get 3.. Then bring down the next number (6) to make the new number 36.

```
  23
4⟌ 956
 -8
  15
 -12
   36
```

Another cycle is complete, so begin the next cycle by asking how many times 4 goes into 36—that is what's 36÷4? The answer, this time is 9. Write down the 9 above the 6 , multiply 9·4=36, and place this below the 36.

```
   239
4 |956
  -8
   15
  -12
    36
   -36
     0
```

Now subtract 36-36=0 Because you have no more numbers to bring down, you're finished, and the answer (that is the quotient) is the very top number of the problem.

Divide 860÷5

Divide 434÷2

Divide 525 ÷5

Divide 3,245÷5

Divide 91,220÷8

Divide 47÷5

Divide 1002÷2

If you missed any of the first page—have your teacher check first—then do this page

Divide 4321÷5

Divide 580÷5

Divide 5438÷3

Divide 1234÷3

**if you did well on the past few pages of operations, you can use your calculator for these—if your teacher approves. Ask first!
The four operations that you have been doing—addition, subtraction, multiplication, and division are pretty basic. Next, we will show the "inverse operations" of the four. Inverse means that they undo each other. You will also discover that the commutative property allows you to rearrange numbers in an expression. Plus you will learn how to rewrite numbers to allow you to solve them more easily.

The big four operations are actually two pairs of inverse operations which means the operations can undo each other.

Addition and subtraction: subtraction undoes addition.
2 +3=5 5-3=2

Multiplication and division: division undoes multiplication
5·2=10 10÷5=2

The commutative property of additions tells you that you can change the order of the numbers in an addition problem without changing the result, and the commutative property of multiplication says you can change the order of the numbers in a multiplication problem without changing the result.

2 +5=7 5+2=7
3·2=6 2·3=6

Through the commutative property and inverse operations, every equation has four alternative forms that contain the same information expressed in a slightly different way. For example 2+3=5 and 3+2=5 are alternative forms of the same equation but changed using the commutative property. And 5-3=2 is the inverse of 2 +3=5. Confusing?? Just fill in the blanks☺

When the first number is missing in any problem, use the inverse to turn the problem around:

_____+ 6=10 ⇨ 10-6=_____

When the second number is missing in an addition or multiplication problem, use the commutative property and then the inverse:
9+_____=17 ⇨ _____+9=17 ⇨ 17-9=_____

When the second number is missing in a subtraction or multiplication problem, just switch around the two numbers that are next to the equal sign:

15-_____=8 15-8=_____

Let's fill in the blanks

_____÷2=10 10x2=_____

Solve:

16+_____=42 42-16=_____

20÷5=_____ _____5=20

_____-74=36

_____˙7=105

45 +_____=132

273-_____=70

8˙_____=648

180÷_____=9

121÷11=_____

144 ÷_____=12

Parentheses group operations together, telling you to do the operations inside a set of parentheses first before you do anything outside of it. This can make a HUGE difference in your answer.
For example:

What's (21-6) ÷3? and What's 21- (6÷3)?

Your answer is 5 and 19. To solve (21-6) ÷3, first do the operation inside the parentheses---21-6=15 . Then divide 15 by 3. Your answer is 5.

To solve 21- (6÷3), first do the operation in parentheses---6 divide by 3 is 2. Then subtract 21 by 2. Your answer is 19.
Notice how the position of parentheses affects the answer.

Solve the following: 1 + (9+3) and (1+9) +3

Solve $2 \cdot (4 \cdot 3)$ and $(2 \cdot 4) \cdot 3$

Find the value of $(8 \cdot 6) + 10$

Find the value of $123 \div (145-144)$

$(40 \div 2) + 6 =$

(16+25) +18 and 16 +(25+18)
Do the parentheses make a difference?

(9·5) ·2 and 9·(5·2)
Do the parentheses make a difference?

No calculator for this one☺
Just do one and do it correctly

$5\overline{)\,22580}$

Powers and square roots

Raising a number to a power is a quick way to multiply a number by itself. For example 5^3 means that you multiply five by itself three times:
5x5x5=125
The number 5 is called the base, and the number 3 is the exponent.

Solve the following:

2^4=_____ 3^4=_____8^2 = _____ 4^3=_____ 10^3=_____

**The powers with 10 in the base are easy to work with. To raise a 10 to the power of a positive whole number, write down the number 1 followed by the number of 0s indicated by the exponent. For example 10^3 is 1,000

Try these:

$10^{2=}$_____ $10^{8=}$_____$10^{5=}$_____$10^{9=}$_____$10^{3=}$_____

Some rules to remember:

- Every number raised to the power of 1 equals that number itself. $5^{1=5}$
- The number 0 raised to the power of any number (except 0) equals 0, because no matter how many times you multiple 0 by itself, the result is 0.

What is 3^4?

What is 10^7?

What is 52^1?

What is 0^8?

The inverse of squaring a number is called finding the square root of a number. Remember inverse undoes an operation.

$\sqrt{25}$= 5 (because 5 x5=25) Look on your calculator for this symbol and you can practice this easily.

What is $\sqrt{36}$?

What is $\sqrt{81}$?

What is $\sqrt{9}$?

What is $\sqrt{49}$?

This is helpful to remember those squares of numbers.

2x2=_____

3x3=_____

4x4=_____

5x5=_____

6x6=_____

7x7=_____

8x8=_____

9x9=_____

10x10=_____

11x11=_____

12x12=_____

An easy review today

3	9	4	8	5	7	6
x3	x3	x3	x3	x3	x3	x3
9	8	7	6	5	4	3
x9	x8	x7	x6	x5	x4	x3
7	8	9	8	7	6	6
x6	x9	x7	x7	x7	x8	x9
7	6	5	8	4	4	5
x5	x5	x5	x5	x5	x4	x9
6	8	5	3	7	9	4
x3	x3	x3	x3	x3	x3	x3
10	11	12	9	8	7	6
x10	x11	x12	x9	x8	x7	x6
5	4	3	2	1	4	3
x5	x4	x3	x2	x1	x7	x6

Solve: 3421+207=

Solve 4700-69=

Solve 121x87=

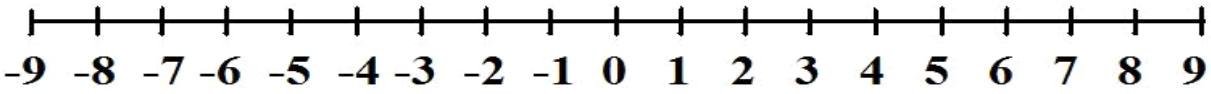
Solve 5250÷5=

Negative numbers

These are commonly used to represent debt and really cold temperatures. They represent amounts less than zero. Such numbers arise when you subtract a larger number from a smaller one.

Typically when we have subtracted, you were told you cannot subtract a bigger from a smaller. This is true if you are dealing with things like objects. If you only have four apples, you can't take six from it. But when you have $5 and buy something that costs $6, you end up with less than $0 dollars---that is -$1 which means a debt of $1.

A number with a minus sign in front of it like -3, its called a negative number. You call the number -3 either negative three or minus three. Negative numbers appear on the number line to the left of 0.



Use the number line and subtract the following numbers:

1-4=_____ you should end up with -3

3-7=_____

5-8=_____

2-9=_____

Find the answers to the following

14-22=_____

28-41=_____

1,000-1243=_____

25-45=_____

When you attach a minus sign to any number, you negate that number. Negating a number means changing its sign to the opposite sign.

- Attaching a minus sign to a positive number makes it negative. 4 changed to -4
- Attaching a minus sign to a negative number makes it positive. The two adjacent (side by side) minus signs cancel each other out. -4 changed –4= 4 or +4
- Attaching a minus sign to 0 doesn't change its value, so -0 =0.

Negate the number 8._____
you should of said -8

What's the negation of 8-10?_____
First do the subtraction, which tells you 8-10=-2. Now attach a negative sign and you have - - 2. The two signs cancel out, which gives you 2.

Negate the number 37_____ the number 328_____

What's the negation of 4-8?_____ 5-10?_____

In contrast to negation, placing two bars around a number gives you the absolute value of that number. Absolute value is the positive value of a number, regardless of whether you started out with a negative or positive number. To picture it, it is the distance from 0 on the number line.

- The absolute value of a positive number is the same number.
- The absolute value of a negative number makes it a positive number.
- Placing absolute value bars around 0 doesn't change its value so /0/=0
- Placing a minus sign outside absolute value bars give you a negative result for example, -/5/= -5 and -/-5/= -5

What does /8/ equal?_____

What does /-18/ equal?_____

Solve the absolute value problem - /9-12/=_____solve inside the lines first.

More practice with negative and absolute numbers

Negate each of the following numbers and expressions by attaching a minus sign and then canceling out minus signs when possible.

Do this one first 9-10_____ you should have gotten 1. You subtract first and get -1 and then add a – sign. two negative signs cancel each other out.

6_____ 5_____ -32_____

0_____ 10+4_____ 16-8_____

9-11_____ 3-4_____ 5-9_____

Solve the following absolute value problems:

/7/=_____ /83/=_____

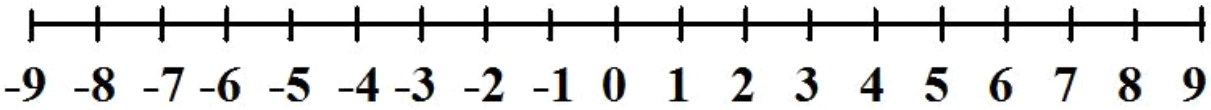
/-14/=_____ /-38/=_____

/3+17/=_____ /2+9/=_____

/1-10/=_____ /2-8/=_____

-/8-2/=_____ -/7-3/=_____

Adding with negative numbers



Use the number line to add -3 +5=_____ Start at -3 and move to the right five times. You end up at 2.

There are some rules to follow when adding negative numbers:

- Adding a negative number plus a positive number. Switch around the numbers and their signs and then subtract. -2 +4= switch to 4-2=
- Adding a positive number plus a negative number. Switch around the plus sign and the minus sign turning the problem into subtraction.
- Adding two negative numbers. Drop both minus signs and add the numbers as if they were both positive and then attach a minus sign to the result. -2 + -3= just add them together , 5 and attach a sign -5

Solve :

-4+7=_____ -1+-7=_____

2+-1=_____ -4+-4=_____

-18+25=_____ -112+84=_____

-54+-11=_____ -80+-10=_____

Subtracting with negative numbers.

When subtracting a negative number, remember that the two back to back minus signs cancel each other out, leaving you with a plus sign. **Math books often put parentheses around the negative number you're subtracting so the signs don't run together, so 3- -4 is the same as 3- (-4)

I have been taught to change the subtraction sign to a plus sign and then either make the number positive by canceling out negative or make it negative. Then follow rules for adding negative numbers.

-3-4= slash your minus sign and change the sign on 4 to -4

-3+-4=-7

Have your teacher show you this

-2- (-4)= changed to -2+(+4)= 2

Solve:

-3-4=_____ 5-(-2)=_____

-1-(-9)=_____ -6-(-11)=_____

-1-8=_____ 4-(-2)=_____

-150-(-78)=_____ -25-(-10)=_____

If you get these wrong and do not understand them, then do the next page, but if you got this, don't worry about it.

17-(-26)=_____ 26-(-10)=_____

9-(10)=_____ 4 + -10=_____

6+ 10=_____ 5-(-1)=_____

8- (-3)=_____ 6- (-8)=_____

What is the absolute value of :

/4/=_____ /-7/=_____

/-7+-4/=_____ -/5-(-8)/=_____

Multiplying and Dividing negative and positive numbers

To do this method, you basically multiply and divide the number just as you normally do and then you decide if it is negative or positive based on these two rules:

- If the two numbers have the SAME sign, the result is POSITIVE
- if the two numbers have OPPOSITE signs, the result is NEGATIVE

**Remember if the answer is positive you can just write the number, you don't have to put the plus sign in front of it. †30 the same as 30

5•6=30 -5•6=-30 -5•-6= 30

Now you try some on your own:

7•(-7)=_____ -8•2=_____ -5•(-5)=_____

-10•(-10)=_____ 9•9=_____ -3•7=_____

25÷(-5)=_____ -64÷(-8)=_____ 81÷(-9)=_____

-28÷(-4)=_____ -45÷(-9)=_____ -72÷8=_____

Let’s review all of the operations with positive and negatives

-143+56=_____ 67+(-7)=_____

-145-(-89)=_____ -453-(76)=_____

542•(-6)=_____ -128•(-5)=_____

642÷(-2)=_____ -3612÷(-3)=_____

Evaluating expressions

An arithmetic expression is any string of numbers and operators that can be calculated. For some it is easy, especially when it is short. When it becomes longer it can become complicated. The term evaluate means the value. You are going to get the value of the string of numbers.

Mathematicians have come up with an order of operations to help you figure out which ones to do first. Do you remember PEMDAS? P-parentheses E-exponents M-multiplication D-division A-addition S-subtraction . This is helpful in showing you which ones go first. We will start out with simpler ones and move on to complex ones.
Remember PEMDAS---sound it out and say it as it is abbreviated—to remember

Addition and Subtraction—just work from left to right on these:

7 + (-2)- (-3)- 2= ? What is your answer_____

Your answer is 6, if you did not get that, ask your teacher before you move forward

7-5+4=_____ -8-3+(-5)-1=_____

-7-5+(-1)- (-2)+6=_____

13-(-7)-6-(-3)-(-3)+2+(-1)-(6)+(-10)=_____

11-5-6+8-(-9)-(-12)=_____

Multiplication and Division

When an expression has ONLY multiplication and division, you work left to right.

What is the answer?_____

15÷5•8÷6

Your answer is 4. If you did not get that, ask your teacher before moving forward.

-10•2•(-3)=_____ 25÷(-5)•3÷(-3)=_____

20÷4•(-5)•(-2)=_____

-18÷6•10•(-2)÷(-30)•(-6)=_____

-5÷-5•15÷(-3)÷(-5)=_____

PEMDAS—remember this order. We are going to do multiplication, division, addition, and subtraction. When you have those in your expressions they are called mixed operators. Do the multiplication and division problems FIRST. It is helpful to underline them in your problem and do them. Then do your addition and subtractions. Place the answer under that part of the expression, to keep everything in line.

$\{-15 \bullet 3 \div (-5)\} - \{(-3) \bullet (-4)\}$_____

Your answer should be -3. If it is not, ask your teacher to show you why.

$\{10 \bullet (-5) \div 2\} - \{(-49) \div (-7)\} =$_____

$8 - \{(3 \bullet 4) \div 6\} + 1 =$_____

$-19 - (7 \bullet 3) + \{(-20) \div 4\} - 8 =$_____

$\{(-50 \div 5) - (-8)\} \bullet (-3) \div 2 =$_____

Now we are going to add exponents to our expressions. Remember those are done before the multiplication, division, addition, and subtraction. PEMDAS

$7-(4^2 \div 2^4)+9 \bullet 2^3$=_____ Your answer should be 78, if not have your teacher show you how.

Evaluate the following:

$3^2-2^3+5^2$=_____

$12^2-(5 \bullet (-5))+ \{(-25) \div (-5)\}$=_____

$(4^2 \bullet (-2))+ 10^2-(-5)+1$=_____

Now we will do the parentheses part of it. Those go first before anything PEMDAS. Keep working in the order of these letters.

(6-2)+(15÷3)=_____ Your answer should be 9.

Evaluate the following:

(5+2•(-7))-{(-9)÷7}=_____

(2•(-5))+ (10-7)•(-2)+(-5•-2)=_____

(4+12÷6•7)- (3-8)=_____

solve $(8+6^2)\div(2^3-4)$ =_____your answer should be 11, if not have your teacher help

$(6^2-12)\div(16\div2^3)$_____

$(10-1^{15}\bullet6) + (10-5)$=_____

$(10-5)^{3\div3+7}$ how do you think this would be solved?_____

What about nested parentheses. First do the inner parentheses if there are any and then work your way out to the nested parentheses.

{3•[10÷(6-4)]}+2_____ your answer should be 17

Evaluate the following:

7+{[(10-6)•5]+13}_____

{(4-6)•[18÷(12-3•2)]}-(-5)

More review of ALL of the operations PEMDAS

$\{6^2\text{-}[12\div(\text{-}13+14)^2]\bullet 2\}^2$

$[(123\text{-}11^2)^4\text{-}\ (6^2\div 2^{20-3\bullet 6})]^2$

$[(8\bullet 4+2^3)\div 10]^4$

Let's do a change this week and work on some real life math word problems. Work through these and if it is okay with your teacher, use your calculator. The second page is the answers. DO NOT look at the answers until you work through the problem.

Lauren makes $36 an hour. She gets a 10% raise. She works 40 hours a week. How much more money will she make this week as a result of her raise?

You want to place a mat that is 3 1/2 inches long in the center of a table that is 7 1/2 inches wide. How far from the edge will you place the mat?

a. 3 inches
b. 5 inches
c. 1 inches
d. 2 inches

Two children conduct the same survey about the number of apples that people eat. The results of the number of people who eat apples in the evening are shown below. In which person's survey did the most people eat apples in the evening?

- Collin reported that 12 out of the 30 people that he surveyed eat apples in the evening.
- Evan reported that 36% of the people that he surveyed eat apples in the evening.

Lauren gets $36 an hour. She gets a 10% raise. 36 x 10% = 3.6
She gets $3.60 more per hour. So she gets an extra $40 x 3.60 = $144
Answer is: $144

The table's size is 7 ½ inches and the mat is 3 ½ inches long. That means that the distance to the center of the table is ½ of 7 ½ inches.
½ of 7 ½ = 3 ¾ inches.
The length of half of the mat is =1/2 of 3 ½
½ of 3 ½ = 1 ¾ inches.
The difference between those lengths is the distance to the edge. 3 ¾ inches- 1 ¾ inches=2 inches

Get everything in the same format so that you can compare the same thing.

Collin is $\frac{12}{30}$ remember to set it up like a proportion and then multiply it by 100 to get your percent. your answer is 40%
Collin has the most.

A shop keeper sold me products. The results of the number of products sold are shown below. Which product had the greatest percentage of its inventory sold? *remember get them into the same form(convert them to percentages)

a. 40 mango jellies out of the 80 jelly are sold.
b. 68% of the apple juice is sold.
c. 0.475 of the cake are sold.

Evan goes to the market and purchases some products. Which product did he purchase the greatest percentage of its stock?

a. 60 orange candies purchased out of 100.
b. 36% of the bananas purchased.
c. 0.589 of the grapes are purchased.

Mom is going to a vegetable shop. She buys a bushel of corn for $23, some potatoes for $30, and a bag of tomatoes for $16. Now she has $20 left. How much money did she have to begin with?

Answers
40 mango jellies out of the 80 jelly are sold.
b. 68% of the apple juice is sold.
c. 0.475 of the cake are sold

Remember we get them into the same form
$\frac{40}{80}$ x 100= 50%

$\frac{475}{1000}$ x 100=47.5%

The apple juice was the greatest product sold

****

60 orange candies purchased out of 100.
- 36% of the bananas purchased.
- 0.589 of the grapes are purchased.

$\frac{60}{100}$x100=60%

$\frac{589}{1000}$x100=58.9%
The orange candies was the greatest product sold

****

First add up all you spent 23+30+16=69 and then add the 20 she has left 69+20=89 She started out with $89

$89-$69=$20

More real life problems. Don't look at the answers on the next page.

Jadyn made 900 cookies for her child. She made 50 cookies in an hour. She worked 6 hours a day. How many days did she work on those cookies?

It was a rainy day. The morning temperature was 9°C. At noon the temperature was 14°C. In the evening the temperature was 12°C. What is the difference between the evening and morning temperatures?

Jentzen used 23 firecrackers and 15 sparklers in one hour. He did this for 7 nights straight. How many firecrackers did he use during that time?

Amber goes to the stationery shop and purchases some products. What percentage of the in-store stock of pens did she purchase? **remember get them all in same form(percentages)

a. 40 of the 60 pens are purchased.
b. 65% of the pencils are purchased.
c. 0.347 of the erasers are purchased

answers

In one day she made 6 x 50= 300 cookies
900÷300=3 days

****

You just take the morning minus the evening temperature

9-12 = a 3 degree difference

****
Take 23 +15=38 for one night
38x7=266 firecrackers he went through
****

Get them all in the same form—percentages

$\frac{40}{60}$x100=66.66% are pens

$\frac{347}{1000}$x100=34.7%

***you only needed to solve for pens☺

Divisibility, Factors, and Multiples

When one number is divisible by a second number, you can divide the first number by the second without having anything leftover. For example, 25 is divisible by 5 because 25÷5=5, with no remainder. You can use a bunch of tricks to test for divisibility without actually doing the division.

The most common tests are for divisibility by 2,3,5, and 10

- ✓ By 2: Any number that ends in an even number (2,4,6,8, and 0 etc) or is even is divisible by 2. Any number that is odd (1,3,5,7.etc) is not divisible by 2.
  3,230 is divisible by 2 and so is 123,333,322

- ✓ By 3: Any number whose digital root is 3,6, or 9 is divisible by 3; digital root means to add up all the digits. For example 213 if you add up all the digits 2+1+3=6 . This number would be divisible by 3. Another example is 768 7+6+8=21 then 2+1=3 yes, would be divisible by 3

- ✓ By 5: Any number that ends in 5 or 0 is divisible by 5

- ✓ By 10: Every number that ends in 0 is divisible by 10. The following numbers are all divisible by 10: 30 56,720 345,650

Every number is divisible by 1. That is, when you divide any number by 1, the answer is the number itself, with no remainder. 3÷1=3 and 17÷1=17

1. Which of the following numbers is divisible by 3?
a. 31
b. 54
c. 768
d.2,809

2. Which of the following numbers is divisible by 2?
a. 37
b. 32
c. 111
d. 76,216

3. Which of the following numbers is divisible by 5?
a. 75
b. 103
c. 230
d. 9,995

4. Which of the following numbers is divisible by 3?
a. 81
b.304
c.986
d.4,444,444

5. Which of the following numbers is divisible by 10?
a. 30
b. 455
c. 320
d.123,250

Answers
1. b and c because they add up to 3
2. b and d because they end in a 2,4,6,8, or 0
3. a,c, and d because they end in 5 or 0
4. a because they add up to 3,6, or 9
5. a, c, and d because they all end in 0

Prime and composite numbers

Remember we talked about numbers in the beginning saying they were either prime or composite? A prime number is any number divisible by 1 and the number itself. It cannot be divided evenly by any other number.

13 and 5 are examples of this. Nothing can divide into these numbers evenly except 1 and the number.

A composite number can be divided by 1, itself, and another number. 10 can be divided by 1,10,2,and 5—it is composite. 6 is a composite number and can be divide by 1,2,3, and 6.
*before you start, go fold the bottom of the next page under so you don't see answers

1.Which of the following numbers are prime?

a. 3
b. 5
c. 9
d.11

2. Which of the following numbers are composite?

a. 65
b.71
c.111
d. 44

3.Which of the following numbers are prime?

a. 17
b. 29
c. 18
d.20

Factors of numbers

Factors are all the numbers that will divide into that number. When given a number go through all the numbers to see which ones will divide evenly into that number.
what are the factors of 10? 1,2,5, and 10 I went through all the numbers 1-10 to see which ones would divide evenly into that number.

4. Find all the factors of 12

5. Find all the factors of 50

6. Find all the factors of 66

7. Is 5 a factor of 20? _____

8. Is 3 a factor of 36?____

9. Is 5 a factor of 222?_____

10. Is 4 a factor of 40?_____

answers
1. a,b,d
2.a,c,d
3. a and b
4. 1,2,3,4, 6, and 12
5. 1,2,5,10,25 and 50
6. 1,2,3,6,11,22,33,and 66
7. yes
8. yes
9. no
10. yes

Making trees

The reason we do this is to find all the factors that make up a number. It also helps you to find the greatest factor that forms that number. Helpful for fractions.

48

50

100

16

120

48

81

10

24

12

33

28

99

75

Finding the GCF or Greatest Common Factor

The GCF of a set of numbers is the highest number that's a factor of every number in that set. Finding the GCF is helpful when you want to reduce a fraction to its lowest terms.

Find the GCF of 12 and 20
Factors of 12: 1,2,3,4,6,12
Factors of 20: 1,2,4,5,10,10

The number 4 is the greatest number that appears on both lists so it's the GCF

Another way:
Find the greatest common factor of 24,36, and 42
Do the trees for 24: 2,2,2,3
36: 2,2,3,3
42 :2,3,7
Underline all the factors that are common to all three numbers: 2 and 3. Multiply those numbers and you get the GCF of 6

1. Find the GCF of 10 and 22

2. Find the GCF of 8 and 32

3. Find the GCF of 15,20,35

4. Find the GCF of 44,56, and 72

5. Find the GCF of 28,42, and 70

Answers—you can't just copy these--- show your work so we know how you got them☺
1.2
2.8
3.5
4.4
5.14

FRACTIONS

Fractions represent parts of a whole—that means, quantities less than 1. When you cut something into pieces, each piece represents a fraction. Cutting a cake one time—gives you ½ a slice of cake if you take one of those pieces.

The top number is called the NUMERATOR. The bottom number is called the DENOMINATOR. The numerator is the number of shaded slices. The denominator is the total number of slices.

When the numerator of a fraction is less than the denominator, that fraction is a proper fraction. ½ or ¾.

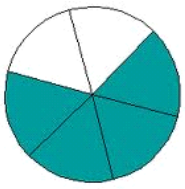
If the numerator is greater than the denominator, that fraction is improper. You can convert improper fractions to mixed numbers.

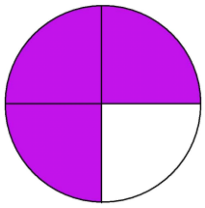
Write whether each fraction is proper or improper

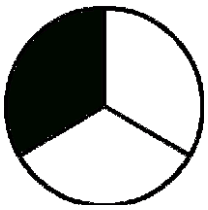
½ _____ $\frac{8}{4}$=_____

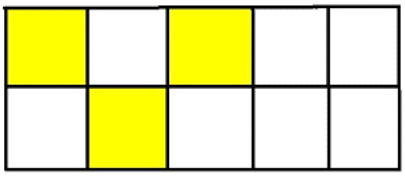
¾=_____ $\frac{12}{7}$=_____

For each shape, identify the fraction of the circle by the parts that shaded.









_____ _____ _____ _____

Some fractions can be written as whole numbers:

- ✓ When a fractions denominator is 1, that fraction is equal to its numerator. 10/1
- ✓ When a fractions numerator and denominator are the same, that fraction is equal to 1. 7/7

When you reverse the order of the numerator and denominator in a fraction, the result is the reciprocal of that fraction. You use reciprocals to divide fractions---soon☺ ½ reciprocal is 2/1

What is the reciprocal of each of the following fractions:

¾ =_____ 6/11=_____ $\frac{5}{7}$=_____

9/10=_____ 88/22=_____ ½=_____

Anytime your numerator is 0 in the fraction, that fraction is equal to 0.

$\frac{0}{1}$=0

The denominator can never be 0.

Rewrite each of the following fractions as a whole number:

$\frac{3}{3}$=_____ $\frac{10}{1}$=_____ $\frac{7}{7}$=_____ 14/1=_____

999/999=_____ 543/1=_____ 0/54=_____

Mixed numbers

A mixed number is a combination of a whole number and a proper fraction added together. Here are some examples.

$1\frac{1}{2}$ $6\frac{3}{4}$ $88\frac{2}{5}$

When you are solving a fraction problem, it is sometimes helpful to convert a mixed number to an improper fraction. Here is how you do it:

1. Multiply the whole number by the fractions denominator
2. Add the numerator to the product from step 1
3. place the sum from step 2 over the original denominator

Now, at the end of some problems, you may need to convert an improper fraction to a mixed number. To do so, divide the numerator by the denominator and then build a mixed number.

- ✓ The quotient is the whole number.
- ✓ The remainder is the numerator of the fraction.
- ✓ The denominator of the fraction stays the same.

***Think of a fraction bar as a division sign.

Convert the mixed number 2 ¼ to an improper fraction._____

Multiple the 4 x2 and then add the numerator. Answer is $\frac{9}{4}$

Convert the following mixed numbers to improper fractions:

5 ½ =_____ 8 ¼ =_____

7 ¾ =_____ 10 2/5=_____

2 1/3 =_____ 7 $\frac{4}{7}$=_____

Now let's do the opposite. Convert the improper fraction to a mixed number. Convert $\frac{11}{2}$ to a mixed number.

Ask yourself, how many times does 2 go into 11 without going over? 5 times with 1 leftover. Answer is 5 ½

Convert the following improper fractions to mixed numbers:

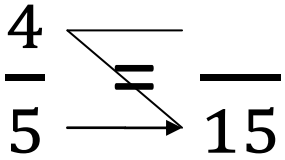
13/4=_____ 22/5=_____

$\frac{17}{3}$=_____ $\frac{13}{2}$=_____

77/10=_____ 81/9=_____

Equivalent fractions

Sometimes at the beginning of a fraction problem, you need to increase the terms of a fraction. This means to write the fraction using a greater numerator and denominator. To increase the terms, multiply both the numerator and denominator by the same number. Also known as the backward Z method☺



You say to yourself…how many times does 5 go into 15? Three times. Then 3 x4 = 12. 12 is your answer

You solve:

Increase the terms of the fraction 2/3 so that the denominator is 18. Write it out with the above method.

Increase the terms of the fraction ¾ so that the denominator is 16.

Increase the terms of the fraction 5/7 so that the denominator is 49.

Increase the terms of the fraction ½ so that the denominator is 12.

Increase the terms of the fraction 1/3 so that the denominator is 15.

Reducing fractions to lowest terms

Reducing fractions is similar to increasing fractions, except it involves division rather than multiplication. But sometimes you can't always divide so reducing takes a little bit more work☺

When reducing fractions, its helpful to know your factoring. We did that a little bit ago. (Trees and GCF).

When shown a fraction, think in your head, what is the greatest number that will divide evenly into those numbers.

Reduce $\frac{12}{15}$ to lowest terms.

I would have to think what factors make up 12: 2,3,4,6
Which make up 15: 3,5
What is the largest common factor between the two? answer is 3.
Take and divide BOTH the numerator and denominator by 3
3 goes into 12=4 times
3 goes into 15=5 times Your answer is $\frac{4}{5}$

Reduce the following fractions to lowest terms:

$\frac{25}{75}$=_____ $\frac{15}{25}$=_____ $\frac{11}{33}$=_____

$\frac{12}{16}$=_____ $\frac{20}{30}$=_____ $\frac{14}{28}$=_____

$\frac{12}{60}$=_____ $\frac{135}{180}$=_____ $\frac{32}{40}$=_____

Comparing fractions with cross multiplication

This is a great tool to know when comparing two fractions. Sometimes a math question could be is ½ larger than 3/8 ? How do you know? This is how you do it!

1. Multiply the numerator of the first fraction by the denominator of the second, writing the answer below the first fraction.

2. Multiply the numerator of the second fraction by the denominator of the first, writing the answer below the second fraction.

Then you take the denominators of the two fractions to find the new denominators.

What fraction is greater 5/8 or 6/11?

$$\frac{5}{8} \quad \frac{6}{11}$$

55 48

Then multiple the denominators 8•11=88 Use this number as your common denominator:

$\frac{55}{88}$ $\frac{48}{88}$ Since 55/88 is greater than 48/88, 5/8 is larger than 6/11

Which is the greater fraction: 2/9 or 4/7

Which is greater 3/5 or 6/11

Which is least 1/3 or 2/7

Let's practice reducing some from a few days ago:

Reduce the following to lowest terms:

5/15=_____ 25/100=_____ 12/144=_____

21/27=_____ 35/50=_____ 30/80=_____

Convert the following to mixed numbers:

22/7=_____ 35/4=_____ 77/11=_____

32/9=_____ 65/5=_____ 82/9=_____

Convert the following to improper fractions:

2 ½=_____ $24\frac{3}{7}$=_____ $3\frac{2}{9}$=_____

17 ½=_____ 22 ¾ =_____ 8 ¼ =_____

Review of fractions

Which of the following fractions are proper or improper?

1/7=_____ 22/9=_____ 2/9=_____

Write the reciprocal of the following fractions:

5/7=_____ 10/3=_____12/19=_____

Rewrite the following fractions as a whole number:

3/3=_____ 12/1=_____ 44/44=_____

Convert the improper fraction $\frac{11}{2}$ to a mixed number:_____

Change $7\frac{2}{9}$ to an improper fraction:_____

Reduce the fraction $\frac{18}{32}$=_____

Increase the terms of 4/9 changing the denominator to 54._____

Reduce the fraction $\frac{12}{60}$ to lowest terms_____

Which is the greater fraction 1/5 or 2/9?_____

What is the lesser fraction 8/21 or ¾?_____

If you have any other problems lets work on what you don't understand.

Multiplying Fractions

Multiplying fractions is easy. Before you multiply, see if you can cancel out common factors that appear in both the numerator and denominator. Just like reducing a fraction. When you cancel and reduce out before you multiply, you get an answer that is already reduced to lowest terms.

$\frac{\cancel{3}^{1}}{\cancel{14}_{2}} \bullet \frac{\cancel{7}^{1}}{\cancel{9}_{3}} =$ to solve you can reduce down a numerator from the denominator by 7.

Then you can reduce down the 3 and the 9. Now just multiply across 1 x1=1 and 2x3=3 Answer $\frac{1}{3}$

**Remember when you reduce down—you can go only from a numerator and a denominator. Not across from each other.

Find $\frac{3}{8} \bullet \frac{6}{11}$ _____

Find $\frac{10}{33} \bullet \frac{11}{25} =$ _____

$\frac{2}{9} \bullet \frac{27}{14} =$ _____

$\frac{9}{14} \bullet \frac{21}{3} =$ _____

$\frac{75}{33} \bullet \frac{11}{25} =$ _____

$\frac{7}{5} \bullet \frac{15}{3} =$ _____

If you are having any problems with the last page—have your teacher check, then do these, otherwise skip it!

$\frac{22}{5} \bullet \frac{25}{33} =$ _____

$\frac{3}{8} \bullet \frac{2}{7} =$ _____

$\frac{22}{3} \bullet \frac{12}{11} =$ _____

$\frac{2}{7} \bullet \frac{3}{4} =$ _____

$\frac{55}{48} \bullet \frac{6}{11} =$ _____

$\frac{7}{77} \bullet \frac{8}{88} =$ _____

$\frac{18}{3} \bullet \frac{35}{7} =$ _____

$\frac{3}{4} \bullet \frac{16}{3} =$ _____

Dividing of fractions

Remember when we reciprocated the fractions? The reciprocal of ½ is 2/1

When faced with a division problem for fractions, you don't actually divide. You flip the second number and then you multiply just like you did yesterday. Easy.

$\frac{5}{8} \div \frac{3}{8} =$ You actually rewrite it as $\frac{5}{8} \bullet \frac{8}{3} =$ Then you reduce down before you multiply. Then multiply across! 5x1=5 and 1x3=3 Answer is $\frac{5}{3}$ But we need to reduce down since it is an improper fraction. 3 goes into 5 how many times? 1 with 2 leftover. $1\frac{2}{3}$

Divide ¼ by 6/7. Rewrite the problem as a multiplication problem.

Find 3/5 ÷ 9/10

Find 8/9÷3/12

Find the following answers and reduce down to lowest terms.

1/3 ÷4/5

Find the following answers and reduce down to lowest terms

3/9 ÷ 21/27

Find the following answers and reduce down to lowest terms

5/25 ÷ 81/9

Find the following answers and reduce down to lowest terms

3/15 ÷7/45=

Find $\frac{11}{8} \bullet \frac{6}{33}$ _____

Find $\frac{10}{55} \bullet \frac{11}{40} =$ _____

$\frac{2}{9} \bullet \frac{45}{18} =$ _____

$\frac{15}{14} \bullet \frac{28}{3} =$ _____

$\frac{75}{66} \bullet \frac{11}{25} =$ _____

$\frac{7}{5} \bullet \frac{30}{3} =$ _____

Increase 4/7 to a fraction with a denominator of 28

Increase 1/3 to a fraction with a denominator of 30

If you are having any problems with the last page—have your teacher check, then do these, otherwise skip it!

$\frac{22}{5} \bullet \frac{25}{33} =$ _____

$\frac{3}{8} \bullet \frac{2}{7} =$ _____

$\frac{22}{3} \bullet \frac{12}{11} =$ _____

$\frac{2}{7} \bullet \frac{3}{4} =$ _____

$\frac{55}{48} \bullet \frac{6}{11} =$ _____

$\frac{7}{77} \bullet \frac{8}{88} =$ _____

$\frac{18}{3} \bullet \frac{35}{7} =$ _____

$\frac{3}{4} \bullet \frac{16}{3} =$ _____

Find 6/5 ÷ 9/15

Find 10/9÷3/12

Find the following answers and reduce down to lowest terms.

2/3 ÷4/13

Find the following answers and reduce down to lowest terms

3/9 ÷ 21/27

Find the following answers and reduce down to lowest terms

5/25 ÷ 81/9

Find the following answers and reduce down to lowest terms

3/15 ÷7/45=

Find the following answers and reduce down to lowest terms

1/10 ÷ 40/100

Increase 3/5 to a fraction with a denominator of 15

Increase 4/7 to a fraction with a denominator of 28

Increase 2/3 to a fraction with a denominator of 21

Addition of fractions

When you add fractions, one important thing to notice is whether the denominators are the same. If they are then you can just add the top numerators, but if they are not, you will have to make them equivalent.

1/5 + 2/5= 3/5 easy enough. What you are saying is that you have a pie that is cut into 5 pieces and you have one of those pieces. The other pie has 3 pieces of the pie cut into 5 pieces. When you add the pieces together you have 3 out of the 5 pieces of pie!

Add 2/7 +4/7=_____ rewrite them so that you can see them clearly.

Add 5/8 + 7/8 and reduce to lowest terms. Rewrite them so that you see them clearly.

Here is a quick way to add fractions. I will show you the "traditional" method but this is quick.

$\frac{1}{3} + \frac{2}{5} =$

Step 1, cross multiply the two fractions and add the results together to get the numerator of the answer.
1 •5=5 and 2•3=6. Then add 5+6=11 11 is your numerator

Step 2, multiply the two denominators together to get the denominator of the answer. 3 •5= 15

Your answer is $\frac{11}{15}$

1. Now you try these: Add 7/9 and 8/9 to lowest terms

2. Find 5/6 +7/10 to lowest terms

3. Add 3/5 and 14/15

4. Find the sum of 3/17 and 10/19 in lowest terms—use calculator

5. Add 11/2 and 19/24

answers

1. 1 2/3 reduced down
2. 1 8/15 reduced down
3. 1 8/15 reduced down
4. 227/323
5. 1 17/24

Now let's do some addition of fractions the traditional way.

We have to get the denominators the same . We have to know what is the lowest number that both the denominators will go into.

$\frac{3}{4} + \frac{7}{10}$ typically you can do the multiples of each number. Multiples of 4 are: 4,8,12,16,20,24
Multiples of 10 are: 10,20,30 oh wait stop they both have 20. So 20 is your new denominator.

$\frac{3}{4} = \frac{\quad}{20}$ now do the backwards z method to solve for the equivalent fractions. 4 goes into 20,
5 times and 5 x3= 15 so numerator is 15

$\frac{7}{10} = \frac{\quad}{20}$ now do the backwards z method to solve for the equivalent fractions. 10 goes into 20,
two times and 2 x7=14, so numerator is 14

$\frac{15}{20} + \frac{14}{20} = \frac{29}{20}$ Reduced down $1\frac{9}{20}$

Now you solve using this method. Add 8/9 and 17/18

add 9/10 and 47/50

Now use whatever method you prefer for addition:

$3/5 + 7/8$

$2/7 + 5/21$

$1/3 + 2/15$

$4/5 + 2/3$

Practice and answer the following, whichever method is your favorite.

2/3 + 4/21

2/5 •20/24

1/5 + 20/3

4/5÷12/25

3/11 + 5/99

Find the sum of 2/17 and 10/21

Multiply 4/7 by 49/16

Divide 6/18 by 12/24

Solve however you would like:

1/8 + 3/16

2/7 + 1/28

4/9 + 3/45

7/17 + 2/3

2/3 • 9/12

7/8• 24/21

11/12• 144/121

13/24• 3/5

Subtraction of Fractions

Just like we learned with addition, subtracting fractions that have the same denominator(aka common denominator) is very simple: Just subtract the second numerator from the first and keep the denominator the same. Then we reduce down to lowest terms.

$\frac{2}{3} - \frac{1}{3} =$ This one is easy, the denominators are the same so just subtract the top 2-1=1

Answer is $\frac{1}{3}$

$\frac{3}{10} - \frac{1}{10} = \frac{2}{10}$ sometimes when you subtract, you need to reduce to lowest terms. Say, what can go into both the 2 and 10 evenly? 2, so divide both the numerator and the denominator by 2 and you get $\frac{1}{5}$

If you have a different denominator, we need to make them the same by either doing this "quick method" or the equivalent fractions. Let's do the quick method like we did for addition.

$\frac{6}{7} - \frac{2}{5}$ = Do the cross multiply like we did for addition (6•5) – (2•7)= 30-14=16

multiply the two denominators together to get the denominator of the answer 7•5=35

Your answer is $\frac{16}{35}$

Now you try, $\frac{9}{10} - \frac{5}{6}$ = in lowest terms

Your answer should be $\frac{1}{15}$

Subtract 7/10- 3/10=

Solve 4/5-1/3=

Solve ¼- 5/22

Solve 1/3- 1/8=

Subtraction of fractions—finding common denominators

Using the cross method is easy and quick for most everything, but let's teach you finding the common denominators so when you have a larger denominator you don't have to reduce so much.

Let's subtract this problem $\frac{17}{20} - \frac{31}{80} =$ you can cross multiply, but you will be dealing with bigger numbers. It is easier to look at the denominators to see if we can get a common multiple for both. 20's multiples are: 20.40.60.80 and 80's multiples are 80, 160, oh wait they both have 80 so let's use that.

$\frac{17}{20} = \frac{\quad}{80}$ do that backwards z method for finding equivalent fractions 20 goes into 80, 4 times. 4 x 17= 68 , your new numerator is 68.

$\frac{68}{80} - \frac{31}{80}$ you don't need to change the second number because the denominator is already 80. Then subtract to get $\frac{37}{80}$

Practice 8/15 – 1/3

5/7 – 7/10

Solve these the same way you were taught today, so that you get the concept. Tomorrow you can choose to do them the easy way.

3/5- 1/3

5/8-1/2

5/7-5/8

½-1/4

1/3-1/6

Subtraction of fractions

Do these the easy and quick way if you would like to, otherwise do the traditional way☺

½-1/2

5/7-4/9

2/3-1/5

5/7-5/8

Simplify these if needed:-you can use a calculator if your teacher allows you to help get the multiplication answer.

8/15-1/3

9/10-10/17

5/7-12/19

3/7-2/9

20/23-5/7

Mixed numbers

Remember what a mixed fraction is? A whole number plus a fraction 2 ½ is an example How you multiple and divide a mixed fraction is to convert the mixed fraction to an improper fraction first and then continue onward either multiply or dividing.

2 ½ converted is 2•2=4 +1=5 answer is $\frac{5}{2}$

Multiply the following after you convert them: $1\frac{3}{5} \bullet 2\frac{1}{3} =$

You should get $\frac{56}{15}$ now you need to convert it back into a mixed number Take 56 ÷ 15= 3 r 11= $3\frac{11}{15}$

Divide the following after you covert them $3\frac{2}{3} \div 1\frac{4}{7} =$

Your answer should be $\frac{7}{3}$, then convert back to a mixed number. 7÷3=2 r 1= $2\frac{1}{3}$

You practice

$2\ 1/3 \bullet 3\ ¼$

answer is 7 3/20 show your work

What is $3\ ½ \div 1\ 1/7$

answer is 3 1/16 show your work

Multiply $2\ 1/3$ by $1\ 3/7$

Find $2\ 2/5 \bullet 1\ 5/6$

More multiplication and division practice with mixed numbers

Multiply 4 4/5 by 3 1/8

Solve 4 ½ ÷ 1 5/8

Divide 2 1/10 by 2 ¼

Find 1 2/7 ÷ 6 3/10

Find 2 ¼ x 2 6/13

2/3 x 2 3/8

5 x 10 1/3

7 ¼ x 2 ½

More practice☺

$2\ 2/5 \div 5\ 3/7$

$2\ \frac{3}{4} \div 4$

$2\ \frac{1}{4} \div 2\ 6/13$

$2\ 1/3 \div 9\ 2/3$

2/3 ÷ 2 3/8

8 ÷ 2 10/13

7 ¼ ÷ 2 ½

5 3/5 ÷ 5 1/7

Addition of mixed numbers

This works the same way except you have a whole number to add into the equation. Line them up in column form when adding to make it easier.

Add 4 1/8 + 2 3/8

$$4\frac{1}{8}$$

$$+2\frac{3}{8}$$

_____ add straight down 4 +2=6 and then 1 +3=4 and denominator stays same $\frac{4}{8}$, reduce down to ½ (remember what number goes into both to reduce it down? 2)

Answer is 6 ½

Add 5 ¾ + 4 7/9 set up in column form

answer 10 $\frac{19}{36}$ show your work

Add 3 1/5 + 4 2/5

Find $7\ 1/3 + 1\ 1/6$

Add $12\ 4/9$ and $7\ 8/9$

Find the sum of $5\ 2/3$ and $9\ 3/5$

Add $13\ 6/7 + 2\ 5/14$

subtraction mixed numbers

Subtraction of fraction is easy if the denominators are the same. When they are different, your first step is to always change them to a common denominator. You can do the quick way or the "find the common multiple way.)

When the two have the same denominator, you can subtract. Here is what you do when the fractional part of the first number is GREATER than the fractional part of the second number.

$$8\frac{4}{5}$$

$$-6\frac{3}{5}$$

_____ just subtract down

$$2\ \frac{1}{5}$$

That is easy enough, right? Now let's try this one:

$$9\frac{1}{6}$$

$$-3\frac{5}{6}$$

_____ you can't subtract 1-5, so you need to borrow(just like in regular subtraction)

you borrow one whole from the 9 and make it 8. Since you borrowed a "whole part" your fraction is divided into 6 pieces. You borrowed 6 of those pieces. So you add 1 +6

8

$$\not{9}\ \frac{1+6}{6}=8\frac{7}{6}$$

$$-3\frac{5}{6}$$

_____

$5\ \frac{2}{6}$ reduced down to make $5\ \frac{1}{3}$

Now you try subtract 19 4/11 - 6 3/8

your answer will be 12 $\frac{87}{88}$ show your work

Subtract 5 7/9 - 2 4/9

Find 9 1/8 - 7 5/8

Figured out 16 2/5 - 8 4/9

Review Addition of fractions

1/3 + 3/5

1/10+1/3

2/7 + 1/6

1/5 + ½

8/15+ 1/3

1/24+ 6/13

1/13+ 1/24

19/21+ 1/15

More review addition mixed fractions

$2\ 1/3 + 9\ 2/3$

$2\ ¾ + 4$

$8 + 2\ 10/13$

$7\ ¼ + 2\ ½$

7/3 + 29/3

9/4 + 32/13

8 + 36/13

29/4+ 5/2

Subtraction review

2/3 - ½

5/7-4/9

½-1/2

2/3-1/2

8/15- 1/3

5/7-7/10

14/25-9/19

7/12-1/6

more subtraction practice

4- 2 ¾

2 2/3 - 1 12/13

38/7 - 12/5

32/13- 9/4

7 - 6 ½

5 3/5 - 5 1/7

12 2/3 - 1

2 -1 11/12

Multiplication fraction practice

20/23 • 5/7

1/6• 7/12

4/5• 1/16

½ • 17/21

$2\ 1/3 \bullet 9\ 2/3$

$8 \bullet 2\ 10/13$

$1\ 11/12 \bullet 2$

$2\ 11/14 \bullet 2\ 2/3$

more multiplication practice☺

12/5 x 38/17

9/4 x 32/13

7/3 x 29/3

28/5 x 36/7

9/5 x 6/1

11/7 x 13/7

5/3 x 4

10/7 x 2

Division of fractions review—remember reciprocal

1/10 ÷ 1/8

1/5÷ ½

10/17÷ 9/10

10/21÷ 4/5

$2/3 \div 15/22$

$13/23 \div 5/8$

$1/8 \div 1/6$

$2/3 \div 15/22$

mixed fraction division review

2÷2

4 1/3 ÷ 4 2/3

7 ÷ 1 ¼

2 1/3 ÷ 2 ¼

2 11/14 ÷ 2 2/3

1 11/12÷2

8 ÷ 2 10/13

5 3/5÷ 5 1/7

Decimals

Decimals are ways to represents parts of a whole, just like fractions. We use decimals in money. $13.22

Decimals use place value in a similar way to whole numbers.

thousands	hundreds	tens	ones	decimal point	tenths	hundredths	thousandths

You can use this chart to expand a decimal out as a sum. Expanding a decimal gives you an idea of how that decimal is put together. 13.104 is equal to $10+3+\frac{1}{10}+\frac{0}{100}+\frac{4}{1000}$

In a decimal, any 0 to the right of every nonzero digit is called a trailing zero. For example, 0.090, the last zero is a trailing zero. You can safely drop this zero without changing the value of the decimal. However the first 0 after the decimal point---is a placeholder which you can't drop.

You can express any whole number as a decimal simply by attaching a decimal point and a trailing zero to it:

7= 7.0 15= 15.0 4,822= 4,822.0

Let's practice expanding the decimals

Expand the decimal 6,321.832

Expand the decimal 321.578

Now let's practice writing the decimals.

Four and Twenty One One-Hundredths

The word "and" means decimal The answer to this would be 4.21

Nine and Eighty Nine One-Hundredths or hundredths

Seven and Forty Five Hundredths

write the following in decimals 2 6/10

your answer would be 2.6

3 3/10

386 453/1000

Multiplying and dividing decimals by powers of 10

Moving the decimal to the RIGHT is the same as multiplying that decimal by a power of 10

- ✓ Moving the decimal point ONE place to the right is the same as multiplying by 10
- ✓ Moving the decimal point TWO places to the right is the same as multiplying by 100
- ✓ Moving the decimal point THREE places to the right is the same as multiplying by 1000

Moving the decimal to the LEFT is the same as dividing that decimal by a power of 10

- ✓ Moving the decimal point ONE place to the left is the same as dividing by 10
- ✓ Moving the decimal point TWO places to the left is the same as dividing by 100
- ✓ Moving the decimal point THREE places to the left is the same as dividing by 1000

Practice:

Multiply 4.283 x100

Your answer should be 428.3

Divide 31.8 ÷100

Multiply .0242 by 1000

Divide 432.45 by 100

Multiply 432 by 1000

Rounding decimals works the same way as rounding numbers. You need to round to either the whole number or one of the decimal places. Just like in rounding whole numbers, look at the place value you are rounding. Now look to the right—is that number 5 or more? Then the place value you are rounding goes up if not it goes down. **remember don't go down a whole number 3.3 rounded to the nearest one goes down to 3 not to 2.

Practice

Round 52.305 to the nearest tenth

Round 191.2839 to the nearest hundredth

Round 99.9995 to the nearest thousandth

Round .00791 to three decimal places

Round 32.4890 to the nearest hundredth

Round 43.2998 to two decimal places

Adding decimals

This is just like basic addition, you just line up the decimals. If you need to add some zeros to hold a place go ahead.

Add 15.1 + .93 + 321.21=

Add 432.23+0.021=

Add 342.134+235.532

Add 423.43+2.56

Subtraction works the same way, line up those decimals
0.748-0.23

674.9-.5.0001

432.87-3.009

432.42-128.11

Multiplying decimals

You do this the same way as you would a regular multiplication problem except you have to count over how many places the decimals are in your problem. For example in

23.5 the decimal is over one place value here
x0.16 the decimal is over two place values here

in your final answer3760, you move the decimal over three places 3.760
You count over however many times you need to move it.

Now you try:

Multiply 0.635 x .2

**remember in your final answer you should move the decimal over 4 times

multiply .525 x .11

No calculator just practice doing these☺

32.2 x .3

23.134 x .2

.014 x .11

642.245x .004

Dividing decimals

I know long division is everyone's favorite?!?!!? But let's learn how to do this and you will more than likely just use a calculator in life. But let's understand the concept, ok?

When you divide decimals you have to take care of the decimal beforehand.

1. Move the decimal point in the divisor and dividend
   Turn the divisor(the number you're dividing by) into a whole number by moving the decimal point all the way to the right. At the same time, move the decimal point in the dividend (the number you're dividing) the same number of places to the right.
2. Place a decimal point in the quotient (the answer) directly above where the decimal point now appears in the dividend.
3. Divide as usual, being careful to line up the quotient properly so that the decimal point falls into place.

Let's practice: $0.3\overline{)\,2.403}$ first move decimal over in the divisor, you move it over to the right one place. Now you have $3\overline{)\,2.403}$ then move the decimal point over one place in the dividend $3\overline{)\,24.03}$ then move the decimal point up on the quotient line $3\overline{)\,24.03}$

then you solve as normal your answer would be 8.01

You try: $9.345 \div 0.05$ your answer will be 186.9, show your work

Do these couple of problems, showing your work

56.70 ÷ .070

**in division of decimal you don't express leftovers as remainders. You simply round to however many your paper asks. Usually it will say round to the nearest whole number or to one or two decimal places.

You may need to add some trailing zeros to help finish your problem. For example in this next problem

Divide 21.9 ÷0.015=

*When you set it up, you will have to add 2 trailing zeros to the dividend. You do this because you need to move the decimal points in each number three places to the right. Continue doing it as instructed. Your answer will be 1460

REVIEW—if you get any wrong do the next page

321.876+0.0065

543.43-21.0012

23.13x0.05

243÷0.03

543.987+43.00124

432.91-86.0042

234.8x 0.05

255÷0.05

REVIEW again☺

32.765 + .00023

5.9-0.065

432.1 x .006

9.36÷ .03

Do this page ONLY if you got last page any wrong

342.987+0.9643

291.001-12.0876

43.95x .0004

2.575÷0.05

LAST DAY REVIEW!!!

549.975+3.00007

654.91-8.0007

632.1x 0.2

5.75÷ .05

Do these ONLY if you got the first page wrong

321.944+1.1238

45.11-.008

321.1 x .052

84.62 ÷ .2

Changing decimals to fractions

There are some common decimals to fractions converts that you should memorize in life.

.1= 1/10
.2= 1/5
.3= 3/10
.4= 2/5
.5=1/2
.6= 3/5
.7=7/10
.8=4/5
.9= 9/10

.33= 1/3
.66= 2/3

.25= ¼
.50= ½
.75= ¾

.125=1/8
.375=3/8
.625=5/8
.875=7/8

The other ones you will have to do a different approach and do some work.

0.3, the 3 is in the tenths place. So you put 3 over 10: $\frac{3}{10}$

.27 the 27 goes over to the hundredths place, So you put 27 over 100: $\frac{27}{100}$
**remember to reduce down if at all possible.

Practice:

Change the decimal 0.33 to a fraction:

Change the decimal 0.299 to a fraction:

Change the following decimals to fractions:

.1=

.2=

.3=

.4=

.5=

.6=

.7=

.8=

.9=

.125=

.25=

.375=

.625=

.75=

.875=

More practice from yesterday:
Change the following decimals to fractions:

.1=

.2=

.3=

.4=

.5=

.6=

.7=

.8=

.9=

.125=

.25=

.375=

.625=

.75=

.875=

Review

32.566+1.00008

4522.322-.0327

1276x .01

3.699÷ .03

Review again to memorize them!!
Change the following decimals to fractions:

.1=

.2=

.3=

.4=

.5=

.6=

.7=

.8=

.9=

.125=

.25=

.375=

.625=

.75=

.875=

Review

7653.8765+1.28766

87644.8765-765.00064

7644.09x1.2

52.60÷.05

Last day for review

Change the following decimals to fractions:

.1=

.2=

.3=

.4=

.5=

.6=

.7=

.8=

.9=

.125=

.25=

.375=

.625=

.75=

.875=

Change these into fractions:

.67

.851

.9011

.33

.899

Changing fractions to decimals

To do this, think of that line as a division bar. Just divide the numerator by the denominator.

Often, you need to find the EXACT decimal value of a fraction. You can represent every fraction exactly or as a terminating decimal or repeating decimal.

- ✓ Terminating decimal: This has a limited number of digits. 0.345 has a limited number of digits (3)
- ✓ Repeating decimal: This repeats the same digits forever. For example $.\overline{33}$ is a repeating decimal. That bar over top means repeating. .33333….

Whenever the answer to a division problem is a repeating decimal, you will notice a pattern when you divide. If you notice the same numbers repeating, place a bar over your quotient to show that they repeat.

If a problem wants you to find the EXACT decimal value, you will have to add 0s until you get an end answer.

For example convert the fraction 9/16 to an exact decimal value.

Divide 9÷16

```
    0.5625
16 ) 9.000
   -80
    100
    -96
     40
    -32
      80
     -80
       0
```

Now you try: Find the exact decimal value of the fraction 5/6

Find the decimal to two places in the fraction 2/3

Find the decimal to 5/11

**you should know these
Find the decimal to ½

Find the decimal to 2/5

Find the decimal to 3/4

You can use your calculator today to change these fractions to decimals.

3/8= Just type in 3 ÷8= and your got your answer_____

Convert 3/16 to a decimal:_____

Convert 1/3 to a decimal:_____

Express 8/25 as a decimal:_____

Express 17/20 as a decimal:_____

Express 5/8 as a decimal:_____

Express 11/16 as a decimal:_____

Express 17/40 as a decimal:_____

Express 19/125 as a decimal:_____

When you have a whole number that is not part of your fraction.

23.75 as a fraction is 23 ¾

Write 432.33 as a fraction_____

Write 4,219. 75 as a fraction in lowest terms_____

Write 32.3 as a fraction in lowest terms_____

Write 3.77 as a fraction in lowest terms_____

Write 3.911 as a fraction in lowest terms_____

Write 4.125 as a fraction in lowest terms* remember this one_____

REVIEW

Change the following decimals to fractions:

.1=

.2=

.3=

.4=

.5=

.6=

.7=

.8=

.9=

.125=

.25=

.375=

.625=

.75=

.875=

Change the fractions to decimals

33/100=_____

975/1000=_____

3 ½ =_____

43 ¼ =_____

34/100=_____

938/1000=_____

Percentages

Percents are a way of describing parts of the whole. The word percent means 100. But in practice, when I say 50 percent of my socks are black, that means that out of the 100 socks I own, 50 are black. Or if you own 10 pants and 5 of them are jeans, then 50% of them are jeans.

To change a whole number percent to a decimal, simply replace the percent sign with a decimal point and then move this decimal point over two places to the left. Then you can drop any trailing zeros.

75%= 0.75 50%= 0.50 34%= 0.34

Sometimes a percent already has a decimal point. Just drop the percent sign and move the decimal point two places to the left. 12.5%= 0.125

Your turn:

Change 90% to a decimal _____

Change 34.6% to a decimal_____

Find the decimal equivalent of 99.44%_____

What is 243.1% expressed as a decimal_____

Convert 2.5% to a decimal_____

Convert 7% to a decimal_____

Convert 3% to a decimal_____

Convert 39% to a decimal_____

Convert 99.9% to a decimal_____

Changing decimal to a percent

Change 0.6 to a percent---Move the decimal to the right two places 60%

Convert 0.57 to a percent

What is 0.3 expressed as a percent

Change 0.015 to a percent

Express 2.222 as a percent

Express 35% as a decimal_____

Express 22.2% as a decimal_____

Express 12% as a decimal_____

Express 9.8% as a decimal_____

Express 89% as a decimal_____

Converting fraction to percent

Here are some conversions from fractions to percents that are useful for real life.

1/100= 1%	1/20=5%	1/10=10%	1/5=20%
¼=25%	½=50%	¾= 75%	1=100%

Beyond these, you will not at all probably ever need to convert a fraction to a percent except outside of math class.

But this is how you do it:

1. convert the fraction to a decimal---dividing it ¼= 1 divided by 4= .25
2. Convert this decimal to a percent—move decimal point two places to right and add percent sign 25%

Your turn—use calculator

Change 1/9 to a percent

Change 3/20 to a percent

Convert 7/8 to a percent

Convert 2/11 to a percent

Percent	decimal	fraction
1%	0.01	1/100
5%		
10%		
12 ½%	0.125	1/8
20%		
25%		
33 1/3%		
50%		
75%		
80%		
90%		
99%		
100%	1	
125%	1.25	5/4
150%		
200%		

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Percent	decimal	fraction
1%	0.01	1/100
	0.05	
	0.1	
12 ½%	0.125	1/8
	0.2	
	0.25	
	0.333..	
	0.5	
	0.75	
	0.8	
	0.9	
	0.99	
	1	
125%	1.25	5/4
	1.5	
	2	

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Percent problems

Percent problems give you two pieces of information and ask you to find the third piece.
The most common type of percent problem is this

50% of 6 is?

The best way to remember is that “of” means multiple. “is” means equal.

50% x 6= use a calculator to solve this. If your calculator does not have the % sign, convert it to a decimal by moving it two places to the left and type in .50 x 6=3

You solve: What is 20% of 350?_____

17% of 125 is ?_____

7% of 200 is ?_____

23% of 100 is?_____

Now some problems will say what percent of 4 is 1?
*remember of means x and is means =, so if you rewrite it you have

_____x4=1

since division is the opposite of multiplication, you take 1 ÷4 and that equals .25 which you convert to 25%

What percent of 5 is 2?_____

What percent of 20 is 5?_____

Some may say what is 10% of ?= 40
let's rewrite it, putting in the multiply and equals sign

10% x _____=40

since division is the opposite of multiplication, you take 40÷ 10% or (.10) and it gives you 400

**Just remember what of means and is means and you will be all set!

What is 30% of what number is 10?_____

35% of what number is 28?_____

More practice

75% of 20 is_____

What percent of 50 is 35?_____

79% of 11 is?_____

What is 37% of 600_____

What is 26% of 150?_____

What is 13% of 100?_____

81.3 is what percent of 271?_____

387.2 is what percent of 484?_____

608.8 is 80% of ?_____

282.6 is 90% of ?_____

740.35 is 85% of ?_____

223.5 is what percent of 745?_____

35.5 of 355 is what percent?_____

Word problems

Stephen ate 1/6 of a pizza, Jentzen ate ¼ , and Madelyn ate 1/3. What fraction of the pizza was left when they were finished?

*to solve you are going to have to add them all up—this will require getting the denominators the same. Then subtract from 1 whole pizza to see how much is left. Do your work.

Mom bought 4.25 pounds of beef and 3.1 pounds of chicken. Dad brought 5.24 pounds of chicken and 4.2 pounds of pork. Which of them bought more meat, and how much more?

* to solve add up each person's meat and then subtract to see how much more. do your work

In a recent election, four candidates were on the ballot. Maryon won 43% of the vote, Maybin won 31%, Anter won 18%, and Baker won 4% of the vote. The remaining votes went to write-in candidates. what percentage of voters wrote in their selection?

**add up all the percentages so far, then subtract from 100% to see the remaining numbers

If apples cost $3 a pound, how much does 5/8 of a pound cost?

*remember the word of means multiply. $\frac{5}{8}$ • 1 pound of apples. What is how much apples you are buying. But you want to know the cost. Since the problem tells you that one pound=$3, you can replace 1 pound of apples with $3.

$\frac{5}{8}$ • 3= remember you can put 3 over 1 and multiply across $\frac{15}{8}$, then grab your calculator and divide 15 ÷8= 1.875 rounded makes $1.88

You solve:
If oranges cost $5 a pound, how much does 7/8 of a pound cost?

Jadyn's grandparents gave her $125 for her birthday. She put 40% of the money in the bank, spent 35% of what was left on a pair of pants, and then spent the rest on a dress. How much did the dress cost?

**work your way through this problem. Grab your calculator☺

More story problems☺

Evan's salary was $30,000 last year, and at the end of the year he received a 5% raise. What will he earn this year?

*you need to find out what percentage it is of the pay amount. Then add them together.

Collin was going to buy a flat screen tv that costs $2,000. The sales clerk offers him a 30% discount if he buys today. What will the television cost him after the discount?

**Find out what percentage of the amount it is and then subtract from original price.

Kristen can buy bottles of water in packages of 6 for $7.68 or in packages of 4 for $7.32. How much money does she save by buying 12 bottles of water at the better price?

Zane needs 53 cupcakes for a birthday party. He already has 2 chocolate cupcakes and 28 vanilla cupcakes. How many more cupcakes should Zane buy?

Jonah wants to ride the bumper cars 4 times and the Ferris wheel 1 time. It costs 5 tickets to ride the bumper cars and 3 tickets to ride the Ferris wheel. How many tickets does Jonah need?

A parking garage near Erica's house is 4 stories tall. There are 20 open parking spots on the first level. There are 7 more open parking spots on the second level than on the first level, and there are 2 more open parking spots on the third level than on the second level. There are 58 open parking spots on the fourth level. How many open parking spots are there in all?

Jayden earns $15 per hour. Last week, he worked 3 hours on Monday, 10 hours on Tuesday, and 7 hours on Wednesday. He had Thursday off, and then he worked 7 hours on Friday. How much money did Jayden earn in all last week?

The adventure club went on a hike to see a waterfall. To get to the hike, the club members took 8 cars and 10 vans. There were 4 people in each car and 10 people in each van. How many people went on the hike?

Understanding powers of ten in exponential form

Raising a number to a power multiplies the number in the base (bottom number) by itself as many times as indicated by the exponent (the top number)

5^3= 5•5•5=125

Scientists often work with very small or very large measurements. To save on space and time, they have developed a shorthand called scientific notation to make it easier.

10^0=1
10^1=10
10^2=100
10^3=1000

You can also raise 10 to the power of a negative number. The result is always a decimal, with the 0s coming before the 1.

10^{-1}=0.1
10^{-2}=0.01
10^{-3}=0.001

Write 10^5 in standard notation

Write 10^{-7} in standard notation

Write 10^{-11} in standard notation

Writing in scientific notation

How to write any number in scientific notation:

1. Write the number as a decimal. Suppose you want to change the number 320,000,000 to a scientific notation. The decimal is at the end of the number.
2. Move the decimal point just enough places to change this number to a new number that's between 1 and 10. Move the decimal point to the right or left so that it goes after the 3 and before the 2. You get 3.2 by moving it 8 places.
3. Multiply the new number by 10 raised to the number of places you moved the decimal. $3.2 \bullet 10^{8}$ (if you moved the decimal to the right instead of the left you would put a minus sign in front of the exponent.

Change the number 0.000000043 to scientific notation

Change 340,000,000 to scientific notation

Change 0.0000000000022 to scientific notation

Change 788,000,000 to scientific notation

Multiplying and dividing powers of ten in exponential notation is easy because you don't have to do the multiply or divide at all.

To multiply two powers of ten in exponential notation, find the sum of the number's exponents. Then write a power of ten, using that sum as the exponent.

$10^7 \bullet 10^3$= add 7 +3=10 new answer is 10^{10}

To divide two powers of ten in exponential notation, find the difference of the number's exponents. Then write a power of ten, using that resulting answer as an exponent.

$10^8 \div 10^2$= take 8-2=6 new answer is 10^6

You solve them:

$10^9 \bullet 10^2$=_____

$10^5 \bullet 10^{-2}$=_____

$10^5 \bullet 10^5$=_____

$10^2 \bullet 10^2$=_____

$10^{-3} \bullet 10^8$=_____

$10^9 \div 10^2 =$_____

$10^{12} \div 10^1 =$_____

$10^{100} \div 10^0 =$_____

$10^{-50} \div 10^2 =$_____

$10^{-25} \div 10^{-21} =$_____

$10^9 \div 10^2 =$_____

Multiplying with scientific notation

Multiplying numbers that are in scientific notation is fairly simple.
For example, lets multiply the following:

$(2.0 \bullet 10^3)$ by $(4.1 \bullet 10^4)$

Multiply the two decimal parts 2.0 x 4.1=8.2
Then multiply the powers of ten by adding the exponents 3+4=7
Answer is 8.2 • 10^7

you try: Divide $3.4 \bullet 10^4$ by $2.0 \bullet 10^8$

$(6.02 \bullet 10^{23})\ (9 \bullet 10^{-28})$ **your answer will be greater than 10 so you will need to move the decimal point one place to the left and add 1 to the exponent.

Write 32,400,000,000 in scientific notation

Write 222,000,000,000,000 in scientific notation

Write .045327600 in scientific notation

Write .0765433888 in scientific notation

Write .00000076544 in scientific notation

Write .0000000003376525228767 in scientific notation

Measurement systems

Two most common measurement systems: English system and metric system.

English measurement is most commonly used in US.

Units of distance

12 inches = 1 foot

3 feet = 1 yard

5280 feet = 1 mile

Units of fluid volume

8 fluid ounces= 1 cup

2 cups= 1 pint

2 pints=1 quart

4 quarts= 1 gallon

Units of weight

16 ounces = 1 pound

2,000 pounds= 1 ton
* don't confuse fluid ounces, which measures volume with ounces which measures weight. These are completely different types.

Units of time

60 seconds = 1 minute

60 minutes= 1 hour

24 hours= 1 day

7 days = 1 week

365 days= 1 year
**the conversion from days to years is approximate, because earth's daily rotation on its axis and its yearly revolution around the sun aren't exactly synchronized. A year is closer to 365.25 days, which is why a leap year exists.

Unit of speed—most commonly used is miles per hour MPH

Unit of temperature—measure in Fahrenheit

Knowing the previous page, answer the following questions. Use a calculator if you would like.

How many hours are in 3 days?_____

How many seconds are in 10 hours?_____

How many inches are in 24 feet?_____

How many feet are in 144 inches?_____

How many minutes are in a day?_____

5 pints are how many fluid ounces?_____

How many hours in one week?_____

How many cups in one gallon?_____

If you have 420 minutes, how many hours do you have?____

If you have 144 inches, how many yards do you have?_____

If you have 256 fluid ounces, how many gallons do you have?____

168 inches=_____feet

100 quarts=_____gallons

288 ounces=_____pounds

76 cups =_____quarts

If you have 6000 seconds, how many minutes do you have?_____

If you have 240 hours, how many days do you have?_____

Metric system is used all over the world. This systems works best when you get the hang of it because you simply move the decimal point in many calculations.

Measure of	Metric units
distance-length	meters (m)
fluid volume –capacity	liters (L)
mass (weight)	grams (g)
time	seconds (s)
temperature	Celsius or centigrade (°C)

Metric Prefixes

Prefix	Meaning	number	power of ten
Tera-	one trillion	1,000,000,000,000	10^{12}
giga-	one billion	1,000,000,000	10^{9}
mega-	one million	1,000,000	10^{6}
kilo-	one thousand	1,000	10^{3}
hecta-	one hundred	100	10^{2}
deca-	ten	10	10^{1}
(none)	one	1	10^{0}
deci-	one tenth	0.1	10^{-1}
centi-	one hundredth	.01	10^{-2}
milli-	one thousandth	.001	10^{-3}
micro-	one millionth	0.000001	10^{-6}
nano-	one billionth	0.000000001	10^{-9}

How many millimeters are in a meter?

Give the basic metric unit for each type of measurement listed below:

The amount of vegetable oil for a recipe_____

The weight of an elephant_____

How much water in a swimming pool_____

How hot a swimming pool is _____

How long you can hold your breath_____

Your height_____

Your weight_____

how far you can run_____

Write down the number or decimal associated with :

kilo-_____

milli-_____

centi-_____

giga-_____

nano-_____

micro-_____

Metric

How many centimeters are in a meter_____

How many millimeter are in a liter_____

How many milligrams are in a kilogram_____

How many centimeters are in a kilometer_____

Knowing what you know about metric prefixes, calculate the following:

76 kilowatts=_____watts

12 seconds=_____microseconds

7 megatons=_____tons

400 gigaHertz=_____Hertz

Knowing the previous page, answer the following questions. Use a calculator if you would like.

English measurements:

How many hours are in 3 days?_____

How many seconds are in 10 hours?_____

How many inches are in 24 feet?_____

How many feet are in 144 inches?_____

How many minutes are in a day?_____

5 pints are how many fluid ounces?_____

How many hours in one week?_____

How many cups in one gallon?_____

If you ever need to convert metric to standard, you will always be able to find a formula online to enter your information into.

Some things to know about the metric system:

A meter is about 1 yard 1 meter =3.26 feet

1 kilometer= 0.62 miles remember that a kilometer is about ½ a mile

1 liter is about 1 quart

1 kilogram is about 2 pounds (2.20)

0 degrees Celsius is 32 degrees Fahrenheit

30 degrees Celsius is 86 degrees Fahrenheit

Water freezes at 32 degrees Fahrenheit and freezes at 0 degrees Celsius

water boils at 212 degrees Fahrenheit and boils at 100 degrees Celsius

your body temperature normally is 98.6 degrees Fahrenheit

Don’t look back at other page and try and answer these:

Your body temperature is :
a. 76.2 degrees
b. 121 degrees
c. 98.6 degrees
d. 12 degrees

Water freezes at what temperature Fahrenheit
a. 20
b. 0
c. 32
d 80

Water boils at what temperature Fahrenheit
a. 0
b. 32
c. 212
d. 100

A liter is about as big as
a. one cup
b. one quart
c. one gallon
d. one foot

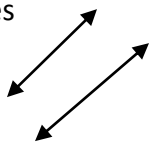
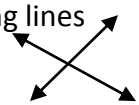
A kilometer is about how many miles
a. two
b. three
c. one
d. half

Geometry

Plane geometry is study of figures on a two-dimensional surface. Also called a plane. A plane is like a piece of paper with no thickness at all. Technically, a plane doesn't end at the edge of the paper, it continues forever.
Here are some concepts in plane geometry.

A point 
This is a location on a plane, it has no size or shape. You draw it by making a dot.

A line 
If you were given two points, you can draw a line through both of them. A line goes on forever. That is what the arrows mean.

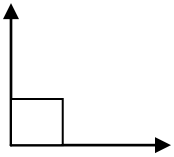
Lines can intersect, share a point or if they don't they are parallel
parallel lines 
intersecting lines 

A line segment
Is a piece of a line that has endpoints. Think of a piece of an orange, called an orange segment. It is just a piece, it ends, it does not go on forever.

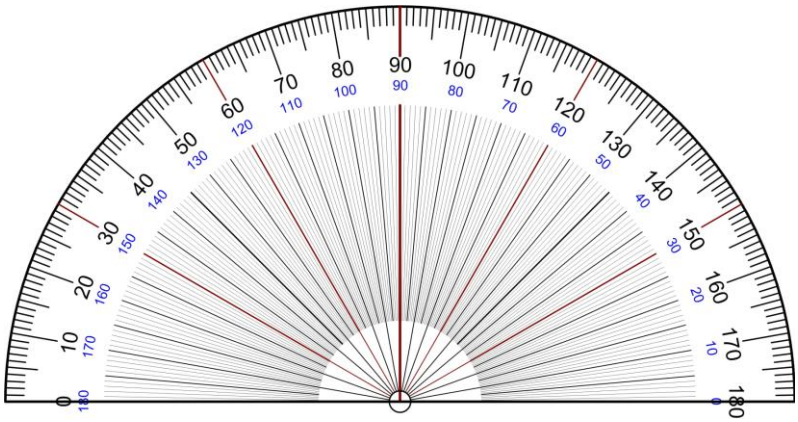

A ray

Think of a "ray of sunshine" this has one end point and then extends out away from the sun.

Angles
When you join two rays at a single point, then you form an angle. Carpenters use these to make corner objects. An angle is measured in degrees. The most common used to make a corner of a box or wall is a right angle. It is 90 degree angle .

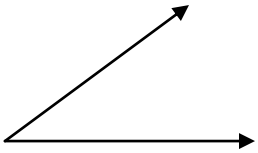

typically they put that box there to show that it is square.

Anything smaller than that is called acute angle. Anything larger is called obtuse angle. When an angle is 180 degrees it forms a straight line and is called a straight angle.



This is a protractor. It is used to make angles. If I were to say to make a 40 degree angle. It would look like this:

see how the above line matches
the 40 degree mark on the protractor?



Grab a ruler, because you should make straight lines and draw me the following:

120 degree angle

90 degree angle

20 degree angle

180 degree angle

A shape is any closed two dimensional geometric figure that has an inside and an outside. A solid is just like a shape, only it's three dimensional.

Shapes are 2 basic types: polygons and nonpolygons. A polygon has all straight sides, and you can identify by the number of sides they have.

Polygon	Number of sides
Triangle	3
Quadrilateral	4
Pentagon	5
Hexagon	6
heptagon	7
octagon	8

Any shape that has at least one curved edge is a nonpolygon. The most common is a circle.

Draw me a pentagon

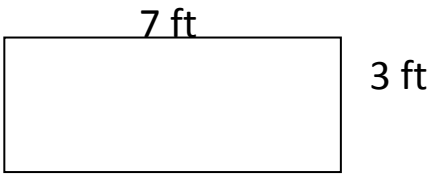
Draw me a hexagon

Perimeter is the distance around an object. This is useful in finding out how much fencing you need to put around your yard. It is also helpful in determining the distance around your room.

To find the perimeter of a polygon, you add up all the sides. Make sure that all the sides are in the same measurements first.

One side of a pentagon is 2 inches long. What is the perimeter?
*draw it out if you need to

Find the perimeter of this rectangle:_____

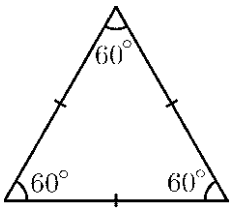


One side of an octagon is 14 yd long. What is the perimeter?_____

Find the perimeter of a rectangle whose length is 10 inches and it's sides are ½ of the length.

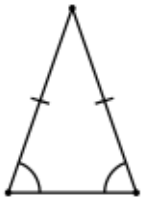
Triangles are a type of 3 sided polygon. Triangles are classified on the basis of their sides and angles.

An equilateral triangle, has three sides that are all the same length and three angles that measure 60 degrees. Look back at your protractor.

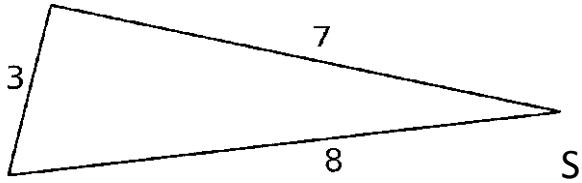


Equilateral

Isosceles triangle, has two sides that are the same length and two equal angles.

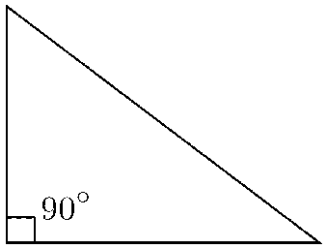

Isosceles Those marks show that those sides are equal and that those angles are equal.

Scalene triangle has three sides that are all different lengths and three different sized angles.



Scalene

A right triangle, has one right angle and it may be isosceles or scalene.



right

Finding the perimeter of a triangle is easy, just add up all the sides.

What is the area of a triangle when the sides are: 3 inches, 5 inches, and 5 inches?_____

The area of a triangle is the area inside of the triangle. It is measured in square units, such as in^2 which means inches squared.

To find the area of a triangle, mathematicians have created a formula for solving it. All you do is plug in the numbers.

A= ½ (b•h)

Area equals ½ the base times the height. First multiply the base and the height and then divide by 2.

What is the area of a triangle with a base of 5 meters and a height of 6 meters? **be sure to label it with m^2

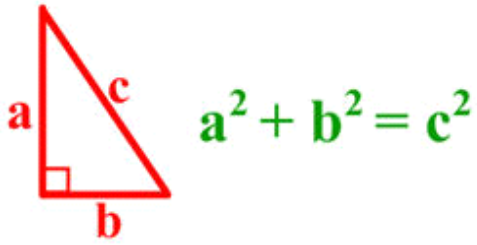
What is the area of a triangle with a base of 10 cm and a height of 6 cm?_____

What is the perimeter of a equilateral triangle whose side measures 25 ft?_____

What is the perimeter of a right triangle, whose side measures 4 inches, 4 inches, and 3 inches?_____

More triangles

The longest side of a triangle is called the hypotenuse, the two short sides are called legs. The most important formula allows you to find the length of the hypotenuse given only the length of the legs. It is called Pythagorean theorem.



This is a formula like for finding the area, you plug in the numbers.
$a^2+b^2 = c^2$

Find the hypotenuse of a right triangle with legs that are 6 inches and 8 inches.

$6^2+8^2 = c^2$

36+64=100
c=10 because 10 •10=100

Now you try
Find the hypotenuse of a right triangle with legs that are 3 and 4 units.

Find the hypotenuse of a right triangle whose legs are 8 feet and 15 feet.

Find the hypotenuse of a right triangle whose legs measure 3 miles and 4 miles.

Find the hypotenuse of a right triangle with two legs measuring 5 millimeters and 12 millimeters

Figure the area of a triangle with base of 2 feet and height of 33 inches.

What's the area of a triangle with a base of 7 centimeters and a height of 4 centimeters?

Find the area of a triangle with a base of 10 meters and height of 17 meters.

What's the perimeter of a triangle whose sides are: 7 ft, 10ft, and 18 ft?_____

Any shape with four sides is a quadrilateral.

This includes: squares, rectangles, rhombuses, parallelograms, and trapezoids. Plus there are many more irregular shapes. We are going to learn how to find the area and perimeter of these.

To find the area of a square and rectangle you simply multiply the length times the width.
The formula is

A=l•w you just plug in the numbers

Find the area of a square whose side measures 4 inches_____
Take 4 •4 and get answer with in^2

Find the area of a rectangle whose side is 10 inches and width is 5 inches._____

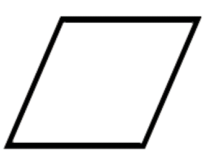
What is the area and perimeter of a square with a side of 9 meters?

What is the area and perimeter of a square with a side of 33 centimeters?

What is the area and perimeter of a rectangle with length of 15 and width of 7?

A rhombus looks like a collapsed square. It has 4 equal sides, but it's 4 angles are not necessarily right angles. A parallelogram looks like a collapsed rectangle. It's opposite sides are equal but it's four angles aren't necessarily right angles. To find the area of a rhombus or parallelogram multiply the base times the height

$A = b \bullet h$



rhombus

parallelogram

Find the area of a parallelogram with a base of 4 feet and height of 3 feet.

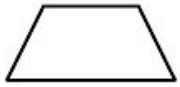
What's the area of a rhombus with a base of 9 meters and height of 6 meters?

Find area of parallelogram with base of 17 yards and height of 13 yards.

Find area of a rhombus with a base of 24 inches and height of 13 inches.

Trapezoid

A trapezoid looks like a triangle that got its top cut off. To find the area of a trapezoid, use the following formula, where



Area = $h(\frac{b^1+b^2}{2})$

base 1 is the top base, base 2 is the bottom base, the height is how tall it is.

What's the area of a trapezoid that has bases of 15 millimeters and 35 millimeters and a height of 21 millimeters?

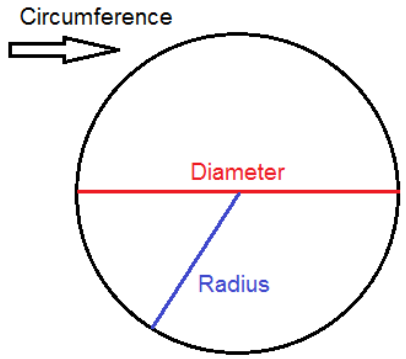
**add the two bases and divide by 2. Then multiply times the height. use calculator for this. Label your answer too!

What's the area of a trapezoid whose base one is 2 inches. base two is 3 inches, and height is 2 inches?_____

What's the area of a trapezoid whose bases are 7 inches and 9 inches and the height is 4 inches?

Circles

The radius of a circle is the distance from the center to any point on the circle.
The diameter of a circle is the distance from any point on the circle through the center to the opposite point on the circle.



The perimeter of a circle has a special name: the circumference. There is a formula for finding the circumference (the distance) around the circle.

$$C=\pi d$$

The symbol π is called pi (pronounced pie.) It is a decimal that goes on forever, so you can't know its exact value. However, we round it to 3.14 when solving problems.

To find the distance around a circle take 3.14 and multiply it times your diameter.

What's the diameter of a circle who has a radius of 4 inches?

What's the circumference of a circle whose diameter is 4 centimeters?

What's the circumference of a circle whose radius is 8 ft? * you have to figure out the diameter to solve this first

To find the area of a circle—the inside part this is the formula:

A= $\pi \bullet r^2$
You take the radius and square it first and then multiply it by 3.14

You try:

What's the area of a circle whose radius is 3 feet?

Find the area AND circumference of a circle that has a radius of 15 yards?

What is the area and circumference of a circle whose diameter is 54 centimeters?

Find area and circumference of a circle that has a diameter of 98 inches?

Find the area and circumference of a circle that has a radius of 4 ft

Okay lots of REVIEW—look back and write down the formulas when solving these problems.

Find the perimeter and area of a square whose side is 5 ft

Find the perimeter and area of a rectangle whose sides are 8 and 10 inches

Find the perimeter and area of a right triangle whose base is 10 yards and height is 18 yards.

Find the hypotenuse of a right triangle whose legs are 9 inches and 7 inches

How many sides does the following have:
triangle___
quadrilateral____
pentagon_____
hexagon_____
heptagon_____
octagon_____

Figure out the area of a parallelogram with a base of 37 yards and a height of 17 yards

What's the area of a trapezoid that has bases of 45 millimeters and 75 millimeters and height of 29 millimeters

What's circumference and area of a circle whose radius is 12 inches

What's area of a rhombus with base of 14 meters and height of 9 meters?

**LABEL EVERYTHING

Okay lots of REVIEW—look back and write down the formulas when solving these problems.

Find the perimeter and area of a square whose side is 35 ft

Find the perimeter and area of a rectangle whose sides are 27 and 59 inches

Find the perimeter and area of a right triangle whose base is 89 yards and height is 225yards.

Find the hypotenuse of a right triangle whose legs are 12 inches and 10 inches

How many sides does the following have:
triangle___
quadrilateral____
pentagon_____
hexagon_____
heptagon_____
octagon_____

Figure out the area of a parallelogram with a base of 137 yards and a height of 117 yards

what's the area of a trapezoid that has bases of 145 millimeters and 175 millimeters and height of 129 millimeters

What's circumference and area of a circle whose radius is 9 inches

What's area of a rhombus with base of 114 meters and height of 91 meters?

**LABEL EVERYTHING

3-d objects

Remember in 2-D objects, the perimeter of a shape is the measurement of its boundary and the area of a shape is the measurement of what's inside the shape. In 3-D world the boundary of a solid is called the surface area and what's inside is called its volume.

You can find the surface area of a polyhedron (solid whose faces are all polygons) by adding together the area of all its faces. You won't need to know this except in geometry. But it is important to know the volume or how much will fit inside an object.

To find volume for a cube or rectangular solid like a box:

V=l•w•h

You multiply the length times the width times the height.

Draw me a cube

Draw me a rectangular solid, also known as a box

Find the volume of a cube whose side is 5 inches**since your multiplying three numbers when you label your measurements you add a 3 to the answer meaning cubed in^3

Find the volume of a rectangular solid whose length is 4cm, width is 2 cm, and height is 3 cm. LABEL

You can also find the volume for a cone, sphere, and a cylinder. Again this is not something you will probably EVER do, but if you have to one day, google the calculator for solving the formula☺ But to know how to do it for a cube and box is helpful in life.

Give me a real life example of the following:

sphere

cone

cube

cylinder

Find the volume of a cube whose side measures 81 cm

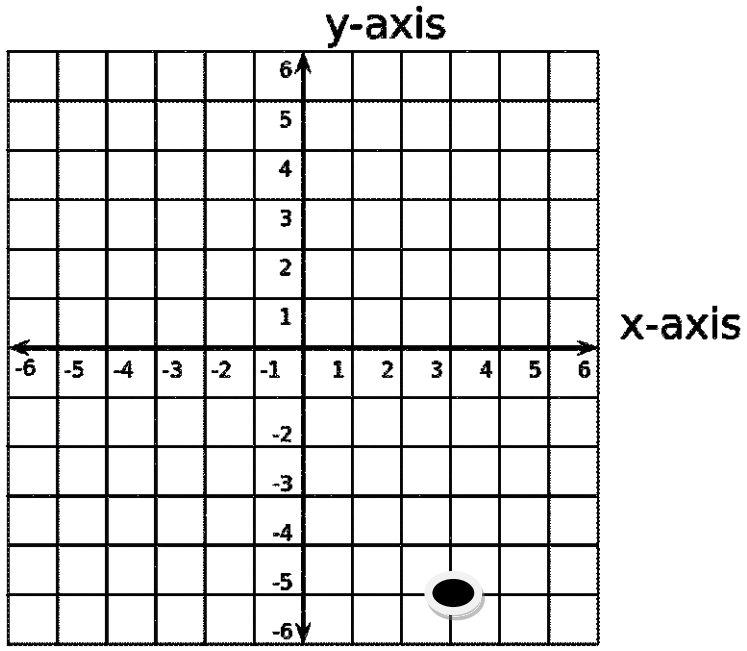
Find the volume of a box whose length is 21, height is 43, and width is 198 all in yards.

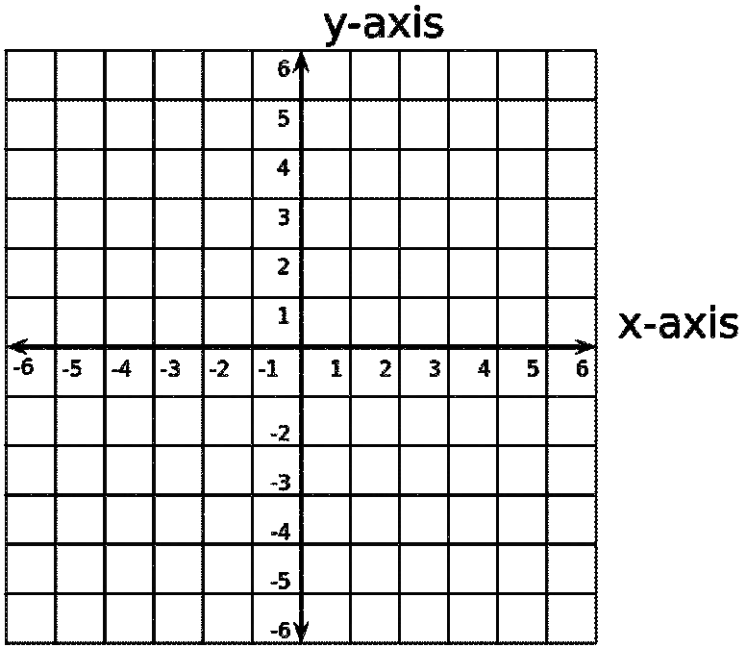
Graphing

Graphing is a visual tool for providing information about numbers. A Cartesian graph is basically two number lines that cross at 0. These number lines are called the x-axis (which run horizontally) and the y-axis (which runs vertically). These two cross at a point called the origin.

Every point on the Cartesian graph is represented by a pair of numbers in parentheses, called ordered pair. The first number is for the x-coordinate and the second is for the y-coordinate.

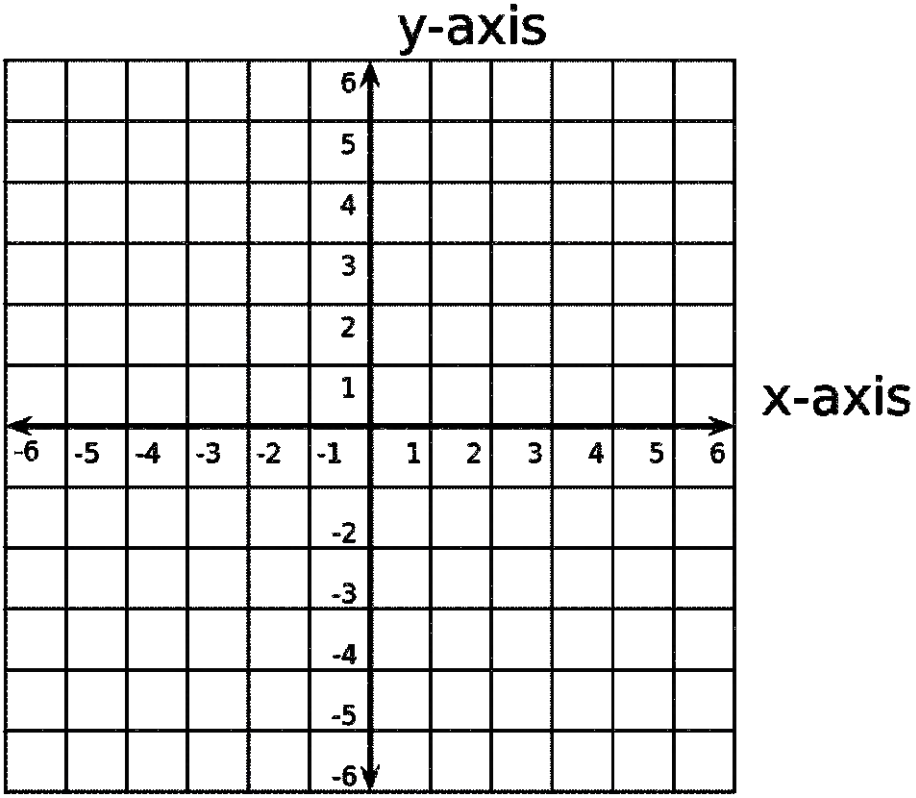
To plot = (3,-5), start at the origin and count three places to the right and then travel down five places and plot your point there.





Plot the following:

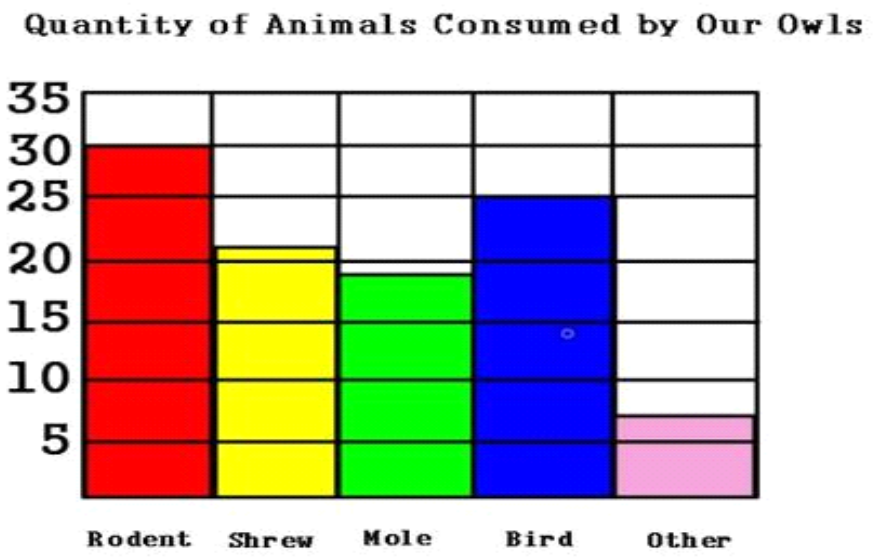
A= (2,5)
B= (-3,1)
C= (-2,-4)
D= (6,0)
E= (-5,5)
F=(0,-1)



Plot the following:

(0,0)
(1,1)
(2,2)
(3,3)
(4,4)
(-1,-1)
(-2,-2)
(-3,-3)

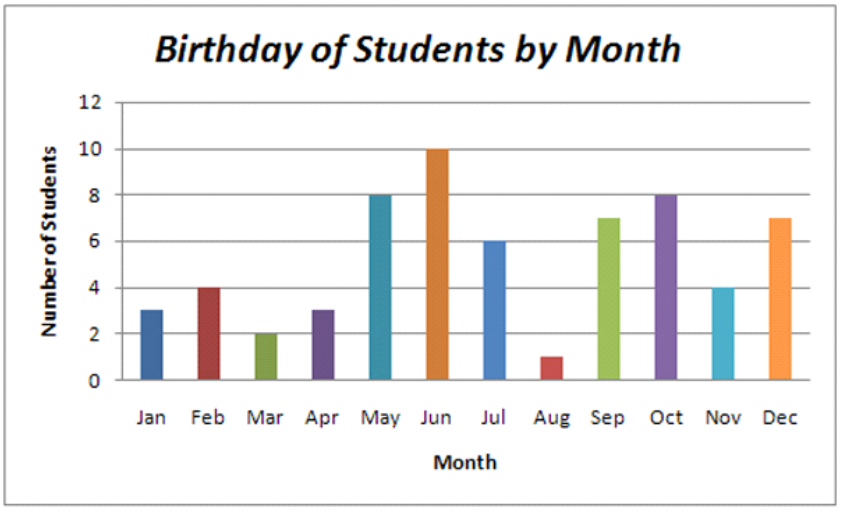
Then draw a line to connect your coordinates—add arrows to the end of your line



Graphs are useful in finding out information in a visual way. As you can see form this great chart about the quantity of animals consumed by our owls?!? –it is what I could find in Microsoft office☺

What animal was consumed the most_____

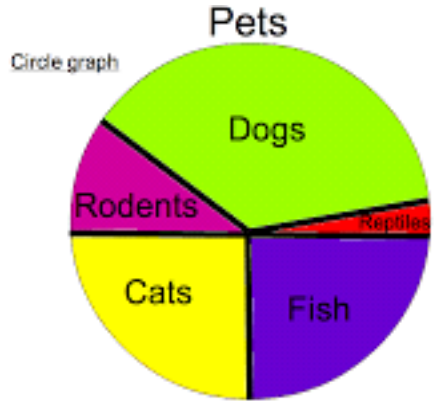
How many rodents and birds did the owls consume_____



In which month are birthdays the greatest_____

Which month are the least amount of birthdays in_____

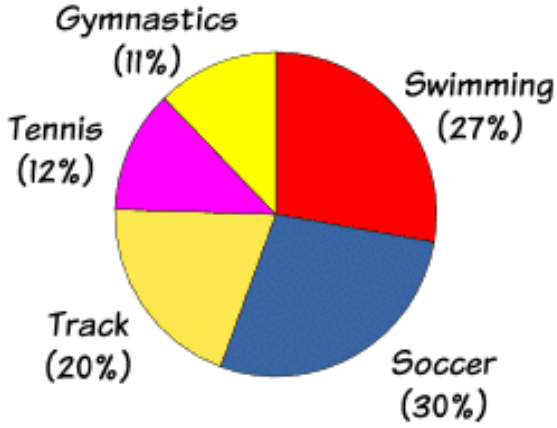
How many birthdays are in the summer months (june, july, august)_____



Here is another graph. It is known as a pie chart. You can look at this and notice which pet people mostly have.

Which pet do most people have_____

Which pets are equal _____



Which activity do most students do_____

Which activity is the least popular_____

How much percentage more do people swim than play tennis _____

What is the sum of the track and soccer players_____

After you understand how to plot points on a Cartesian graph, you can use this skill to draw lines that represent equations on the graph.

You can use the coordinates from the table to plot points on the graph. When the points line up you can draw a straight line through them to represent the function on the graph. You really only need to plot two points to figure out where the line should go, but it is good to do a few more, to make sure your straight☺

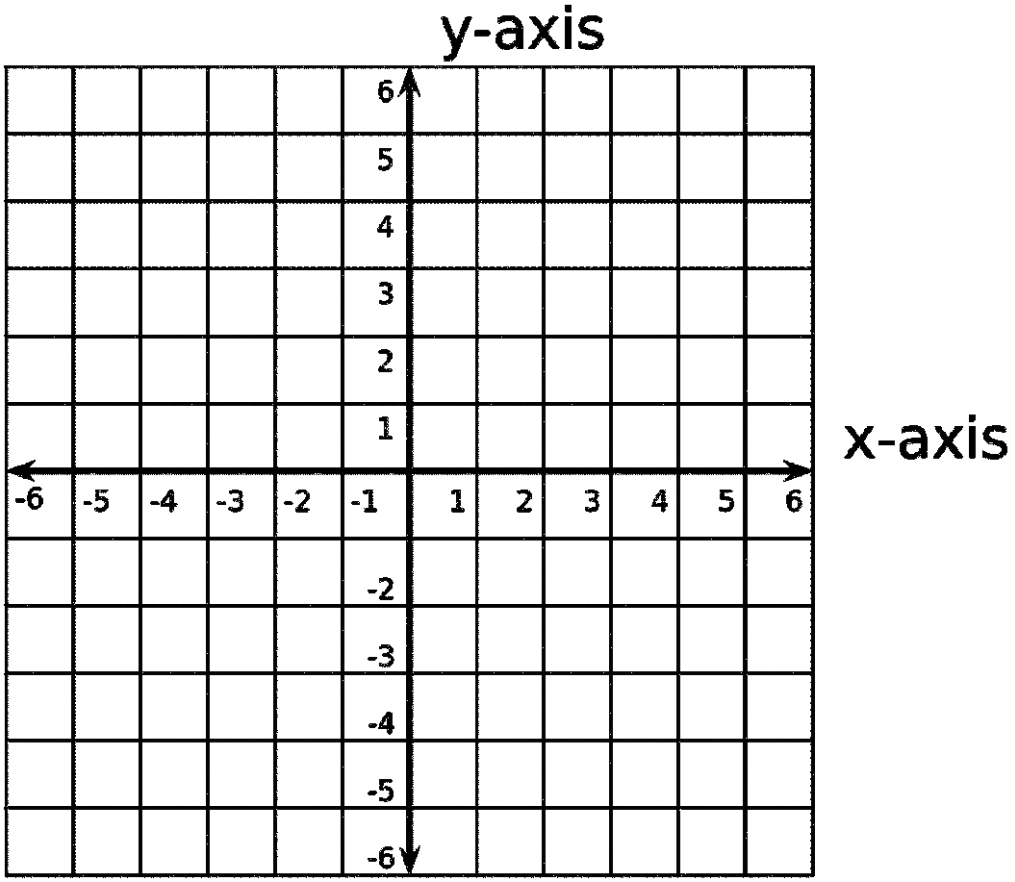
A function, is a mathematical machine. It is often in the form of y= some expression that involves x—that turns one number into another number. The number you start with is called the input, and the new number that comes out is called the output. When graphing the input is usually the x and the output is the y
Let's practice
Let's draw a line representing this statement: Evan has $2 more than Collin.

To do this, make a chart:

Evan	2	3	4	5
Collin	0	1	2	3

Now you have four pairs of points to graph. (2,0) (3,1)(4,2)(5,3)

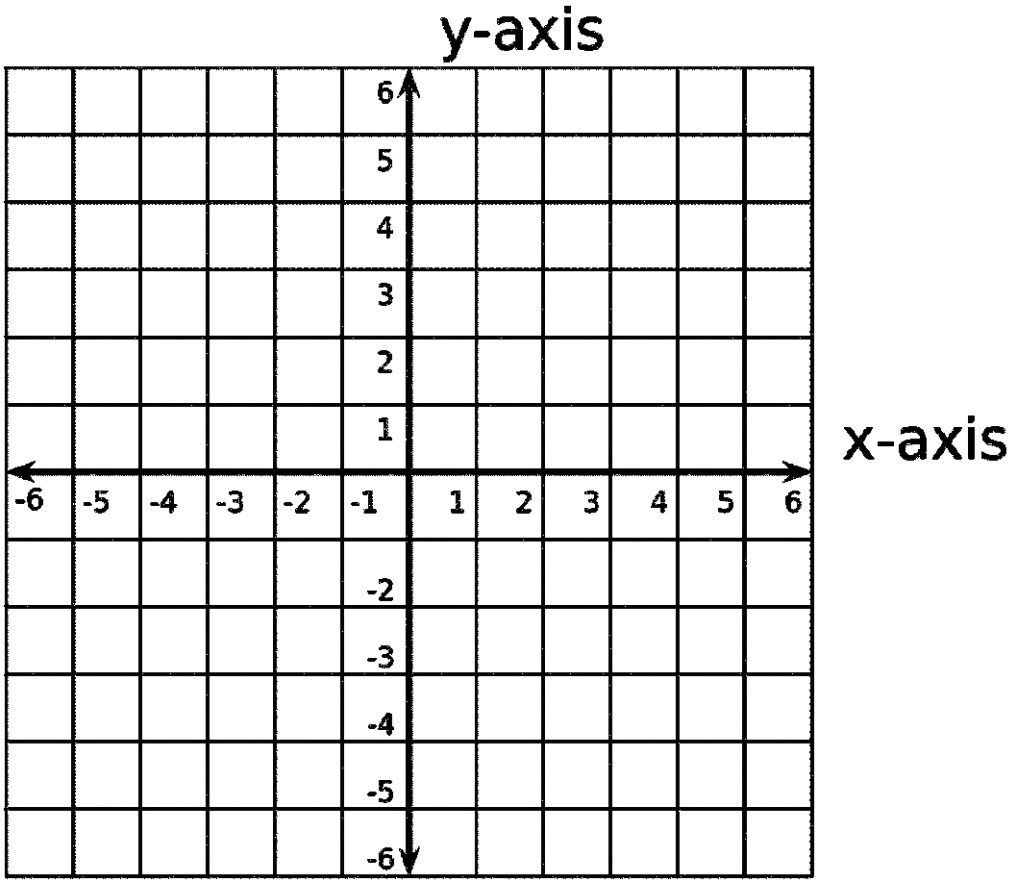
Then draw a line through the points. The line represents every possible pair amount for Evan and Collin. For example, if Evan has 6, then Collin will have 4.



Lets make an input-output table for the function y= x-1

input value x	x-1	output value y
0	0-1	-1
1	1-1	0

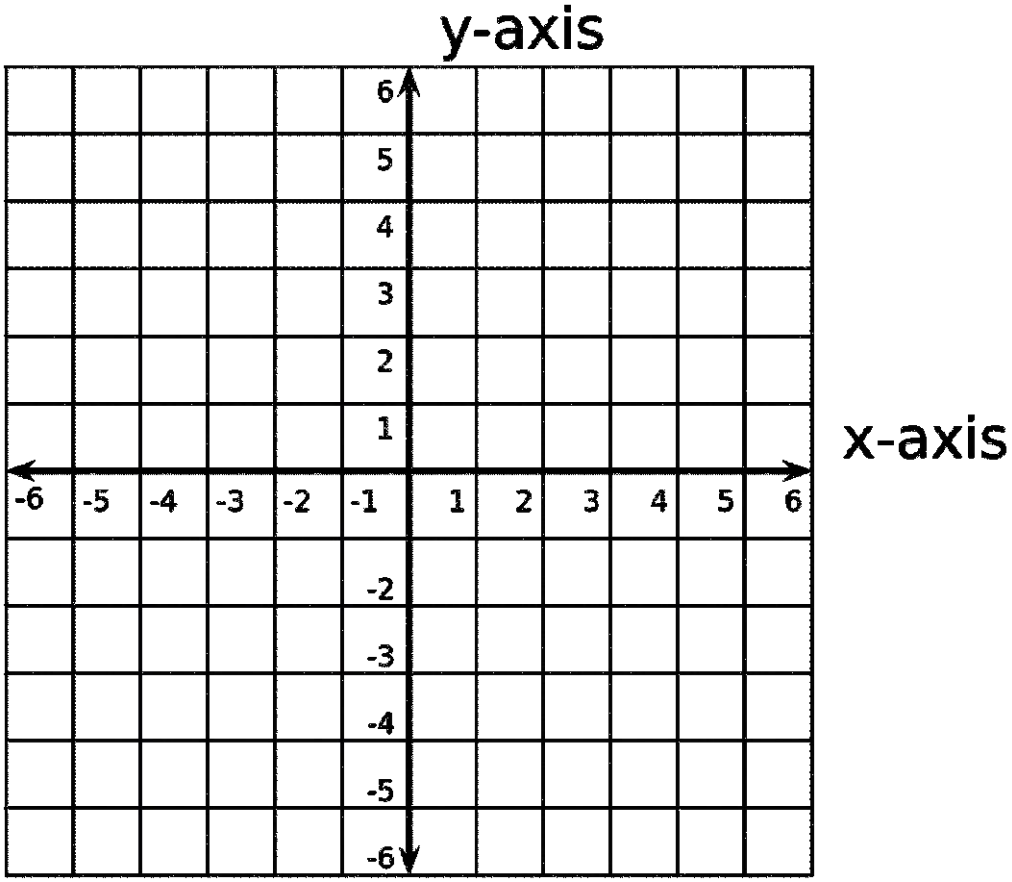
Fill in the rest of the chart. Then graph your coordinates. Your first ones will be (0,-1)(1,0)—draw a line



Let’s make a input output table for y=2x

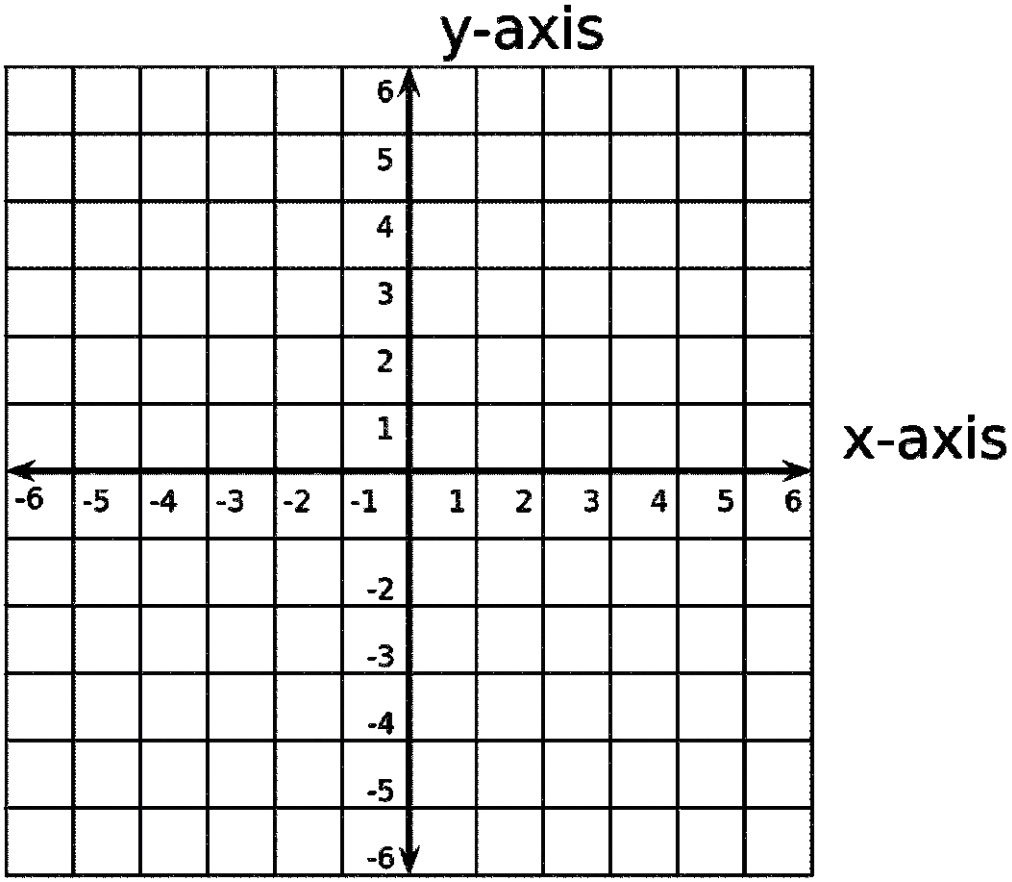
input value x	y=2x	output value y
1	2 •1	2

(1,2)



Let’s make a table

input value x	y=3x-5	output value y



Let’s do some word problems for a change today☺

I want you to take your age_____. I want you to figure out how many seconds old you are.

You will need these:
1 year=365 days
1 day=24 hours
1 hour=60 minutes
1 minute=60 seconds

Would you rather work seven days at $20 per day or be paid $2 for the first day and have your salary double every day for a week?

Imagine that you bought a collector toy for $6, sold it for $7, bought it back for $8, and then sold it for $9. How much profit did you make?

If Evan's cell phone plan costs $30 per month plus $0.35 per minute that he talks over 250 minutes. If he talked 320 minutes in June, what will his cell phone bill be?

Collin just purchased a home entertainment center. His flat screen TV cost 31 times as much as his DVD player costs. If his DVD player cost $90 how much did his TV cost?

An electric company charges a customer a $10 service charge plus $0.04 for each kWh of electricity used. Find the amount Greg will have to play if he uses 1,500 kWh in a month.

Evan spent 2/3 of his money on video games. He has $30 left. How much did he begin with?

Mean, Median, and Mode

Finding these answers is helpful in determine average weather temperatures, baseball stats, gaming stats, etc.

Finding the mean. The mean is the most commonly used average. How do you find it? Add up all the numbers and divide by the number of items you added.

What is the average age of children in our family?
Add up all the ages:
4,5,7,8,10,11,16,19,21,24 _____
When you get your number divide it by 10, the number of children _____This is the average age of kids.

What is the average of the following gaming stats that I played this week:

Sunday	432
Monday	321
Tuesday	119
Wednesday	89
Thursday	322
Friday	90
Saturday	121

Add them all up (use calculator) and divide by number of days played.

What is my average?_____

Here are my bowling scores. What is my average?

1	251
2	300
3	61
4	89
5	124
6	227
7	185
8	300

What is the average temperature this week?

Sunday	65
Monday	89
Tuesday	99
Wednesday	73
Thursday	73
Friday	98
Saturday	101

Finding the median

When you have a few very high or very low numbers in your string of numbers and they differ significantly from rest of the data, the median can give you a more accurate picture of what's standard.
Here is how you find the median of a set:

Arrange the numbers from lowest to highest. Then choose the middle number. Easy.

32 78 <u>89</u> 95 103

Finding the mode

The mode is the number most commonly found among your string of numbers.

33 65 87 65 88 65

65 is the mode for this set

Your turn to try:

Here are the salaries that your father has made over the last 7years:--use a calculator

2017	54,525
2016	52,500
2015	47,000
2014	78,500
2013	52,500
2012	62,345
2011	53,000

What is the median of your father’s salary:

What is the mode of your father’s salary:

What is the mean of your father’s salary:

Statistics and probability

These are two of the most important and widely used applications of math. Statistics is science of gathering and drawing conclusions from data. An individual statistic is conclusion based on this data. Here are some examples:

- ✓ An average family has 2.4 children.
- ✓ Only 43% of students graduate from high school.

Probability is deciding how likely an event is to occur. It has a wide variety of applications in insurance, weather prediction, and sciences.

- ✓ What's the likelihood that the lottery ticket I bought will win?
- ✓ What's the likelihood that it will snow in WNC this winter?

The probability that an event will occur is a fraction whose numerator and denominator are :

$$\frac{\text{number of favorable outcomes}}{\text{total number of possible outcomes}}$$

Favorable means an outcome in which it DOES happen. Possible means one that CAN happen.

For example: What is the probability that a tossed coin will land heads up. There are only two possible outcomes. Only one is favorable—the head's up one. To find the probability make a fraction

$$\frac{\text{number of favorable outcomes}}{\text{total number of possible outcomes}} \qquad \frac{1}{2}$$

The probability that the coin will land heads up is ½ or 1 to 2 or 1:2

You try:

What's the probability that when you roll a die, the number 4 will land face up? ** to figure this out, how many possibilities are there?

What's the probability that in a deck of cards you will pick a King?**how many cards in a deck? How many possible kings?

What's the probability that you will select a day of the week that starts with an S ?

What's the possibility that you will select a month that starts with J?

Consider a true-false test. How many possible outcomes are there if the test consisted of (a) 2 questions? (b) 3 questions?

Algebra

In math x stands for a number—any number. Any letter that you use to stand for a number is a variable. Which means that the number value can vary. In contrast, a number in algebra is often called a constant because its value is fixed.

Sometimes you have enough info to solve for x

2 +2=x x = 4

Sometimes you won't as in
x >4 this could be any number greater than 4

Remember when we did algebraic expressions way back in the beginning of the year?

7 • 5+2=

Now we are going to do the algebraic expressions

x^2y- 5x+ $\frac{z}{3}$

To solve these, you need to know the numerical value of each letter. An expression can have a number of variables, but typically no more than three. x,y, and z are the basic ones.

Let's solve: x =2

x^2+ 5x-x=

Let's solve this one $3x^2$+2xy-xyz

x=3 y=-2 z=5

Just plug in the numbers and evaluate it. Literally, rewrite the problem below with the variable amounts in it.

Evaluate the expression x (x^2-6)(x-7) When x =4

Evaluate $3x^2$+5xy+$4y^2$
when x=5 and y=7

Adding and subtracting terms

Add similar terms by adding their coefficients and keeping the same variable part.
For example, in the express 2x +3x. 2x is just shorthand for x +x, and 3 x means x+x+x

When the variable parts of two terms are the same, you add the terms by adding their coefficients 2x +3x= (2+3)x. Like adding 2 apples and 3 apples.

You CANNOT add non similar terms. For example, these cannot be added together:
3x +4y
3yz+3y
$2x^2$+5x

It's like adding two different things. You cannot add apples to oranges.

Subtraction works same way.
3x=x if you were to write it all out it would be x+x+x-x=2x

3x-6x= would be -3x

You cannot subtract non similar terms like shown in addition.

Your turn:

What is 24 x^3-9x^3

What is 15 x + 3x

Add x^3y^2+ 18x^3y^2

Subtract -xyz- (-xyz)

REVIEW

Sunday	65
Monday	89
Tuesday	99
Wednesday	73
Thursday	73
Friday	98
Saturday	101

What is the mean of the temperatures?

What is the mode of the temperatures?

What is the median of the temperatures?

What is the likelihood that out of the 12 months, I will pick one that starts with a J?

Percent	decimal	fraction
1%	0.01	1/100
5%		
10%		
12 ½%	0.125	1/8
20%		
25%		
33 1/3%		
50%		
75%		
80%		
90%		
99%		
100%	1	
125%	1.25	5/4
150%		
200%		

Multiplying algebraic terms

Unlike adding and subtracting you can multiply non similar terms.

For example, suppose you want to multiply 5x (3y)

To get the algebraic part, combine variables x and y and multiply the numbers

15xy

For example: multiply 2x (7x). Multiply the two coefficients and collect their variables .
14xx= 14 x^2

Here is another example ($x^2y^{3)}$ (xy^5)(x^4)

Add the exponents of the 3 x's (2+1+4=7) Then add the two exponents for y 3+5=8

$$x^7y^8$$

Your turn:

Multiply 4x(7x^2)

Multiply -xy^3z^4(10 $x^2y^2z^2$)(-2xz)

Divide $\frac{6x^4y^5}{8x^4y^4}$ Make a fraction of the numbers ¾

and then cancel out factors in coefficients that are in both the numerator and denominator. you have a y left on the top

Final answer $\frac{3y}{4}$

If you needed to, you could write all your x's out to show that you had four on top and four on the bottom. They would then cancel each other out.

Divide $\frac{7x^2y}{21xy^3}$

Divide $-6x^2yz^3$ by $-8x^2y^2z$

Simplifying expressions

An algebraic express maybe be complex and you will want to simplify it to make it easier to work with. You are going to make it smaller and easier to manage.

1. Combine similar terms. When two algebraic terms are similar, you can add or subtract them.

4x-3y+2x+y-x+2y
Rearrange them so that the terms are all by each other

4x +2x-x-3y+y+2y

Now add and subtract similar terms
5x +0y= 5x

Your turn:

Simplify the expression x^2+2x-7x+1

Simplify the expression $4\ x^2$-3x+2+x-7x^2

Simplify the expression $3x^2$+5x^2+2x-8x-1

Simplify the expression x^5-x^3+xy-5x^3-1+x^3-xy+x

Expressions with parentheses

When and expression has parentheses, you need to get rid of the parentheses before you can simplify.

- ✓ Parentheses preceded by a plus sign just remove the parentheses.
- ✓ Parentheses preceded by a minus sign, change EVERY term inside to the opposite sign—then remove the parentheses
- ✓ Parentheses preceded by no sign—a term directly next to a set of parentheses—multiply every term inside the parentheses by the term next to it. Make sure to include your plus or minus sign in your terms. Remove the parentheses and then combine

Simplify 7x + (x^2-6x+4) -5

*answer is x^2+x-1

Simplify x-3x(x^3-4x^2+2)+8x^4

**answer is 5x^4+ 12x^3-5x

Simplify 6x-(2xy-3y)+5xy

Simplify 2(3x-fy+4)

Simplify the expression $-x^3(x^2+x)-(x^5-x^4)$

REVIEW

Percent	decimal	fraction
1%	0.01	1/100
5%		
10%		
12 ½%	0.125	1/8
20%		
25%		
33 1/3%		
50%		
75%		
80%		
90%		
99%		
100%	1	
125%	1.25	5/4
150%		
200%		

Your body temperature is :
a. 76.2 degrees
b. 121 degrees
c. 98.6 degrees
d. 12 degrees

Water freezes at what temperature Fahrenheit
a. 20
b. 0
c. 32
d 80

Water boils at what temperature Fahrenheit
a. 0
b. 32
c. 212
d. 100

A liter is about as big as
a. one cup
b. one quart
c. one gallon
d. one foot

A kilometer is about how many miles
a. two
b. three
c. one
d. half

Back to algebraic expressions
When an expression has two sets of parentheses next to each other, you need to multiply every term inside the first set by every term in the second set. This process is called FOILing. The word FOIL is a memory device for the words:First, outside, inside, last.

For example: (2x-2)(3x-6)
first multiply 2x(3x)=6x^2
then multiply the outside terms 2x and -6= -12x
then multiply the inside terms -2(3x)=-6x
last multiply the last terms (-2)(-6)=12

Add these four results together to get the simplified expression:

6x^2-12x-6x+12

You can simplify even further

6x^2-18x +12

Your turn:
simplify the expression (x+4)(x-3)

simplify the expression (x+7)(x-2)

simplify the expression (x-1)(-x-9)

simplify the expression 3-4x(x^2+1)(x-5)+2x^3

Solving for x in an algebraic expression

An easy way to solve for x in an expression, is to get the x by itself.

For example 5 +x=6 This may be easy to solve but let's actually work it out to show you what I mean.

You want to get x by itself, how do you do it? you subtract 5 from the left to get rid of it and then whatever you do to one side of the equal sign you do to the other side.

5 +x= 6
-5 -5 Then you are left with x= 1

Another example 6x=24

We want to get x by itself. Since 6 next to the x means to multiply, if we divide by 6 on that side, it will get rid of it. BUT whatever you do to one side, you do to the other side.

$\frac{6x}{6}=\frac{24}{6}$ the 6's cancel out and it leaves x=4

When given a longer one, just work through the steps, get x by itself and do the same thing to each side.

$$3x+7=19$$

$$19x+22=136$$

$$19x-8=600$$

$$13x=273$$

Simplify and solve for x using the methods you were taught

x^5-16+x+20-x^5=24

5xy+x-2xy+27-3xy=73

11x=9x+16

$$5x-4=2x+2$$

$$4x-2=3x+1$$

$$5x+(6x-15)=30-(x-7)+8$$

REVIEW again☺

32.765 + .00023

5.9-0.065

432.1 x .006

9.36÷ .03

Find the perimeter and area of a square whose side is 5 ft

Find the perimeter and area of a rectangle whose sides are 8 and 10 inches

Find the perimeter and area of a right triangle whose base is 10 yards and height is 18 yards.

Find the hypotenuse of a right triangle whose legs are 9 inches and 7 inches

Find the value for x in the equation

$3-(7x-13)=5(3-x)-x$

**answer is x=1

Find the value of x in equation

$7x-6=4x+9$

**answer x=5

Solve $-[2(x+7)+1]=x-12$ for x

*answer x=-1

Find value of x

$4+(2x+6)=7(x-5)$

*answer x=9

rate problems

Rate problems revolve around this formula

$$d=r \bullet t$$

distance equals rate times time

Greg plans to drive 520 miles to North Carolina, to visit his mom. If he drives at a rate of 65 mph, how long will it take to make his trip?

Fill in the numbers into the formula

If I want to visit California, it is 895 miles away. If I drive the speed limit of 70mph, how long will it take to get there?

The distance from Michigan to North Carolina is 770 miles. If we travel the speed limit of 70mph, how long will it take to get there?

Sam needs to replace the siding on the front of his house. His house measures 18 feet across and is 12 feet high. How much siding does he need to buy for?

My yard is 125 feet long and 78 feet wide. It is rectangle shape. How much fencing do I need to keep my dog in?

REVIEW OF EVERYTHING*answer at end—do not look

1. Which of the following statements are FALSE?
   a. 432 is evenly divisible by 9
   b. 12 and 35 are prime numbers
   c. The remainder of 51÷5 is $\frac{1}{5}$

2. The GCF of 100 and 75 is
   a. 5
   b. 25
   c. 75

3. Simplify the expression: 4 [12-3(8-5)]-1
   a.11
   b.24
   c.36
   d.none of the above

4. Simplify the expression 35÷ (6-/-1/)
   a. 5
   b. 7
   c. 4.83
   d. none of the above

5. Simplify the expression: ½ • (1/3 +1/2)
    a. 5/6
    b. 5/12
    c. 3/5
    d. 5/2

6. Simplify $(4x^2y^4)(3x^3\text{y})$

    a. $7x^5y^5$
    b. $12x^5y^5$
    c. $12x^6y^4$
    d. none of the above

7. A small order of chicken costs $6.45, a large order costs $8.35, and delivery costs $3.00. How much will it cost to have three small orders and two large orders delivered?
    a. $37.95
    b. $36.05
    c. $40.95
    d. $39.05

8. Evan ordered 4 large pizzas for a party. Each pizza is cut into 8 pieces, and Evan invited 5 friends. If everyone had the same number of slices, how many slices of pizza will be left over?
    a. 1 slice
    b. 2 slices
    c. 3 slices
    d. 4 slices

9. Jadyn wants to make three loaves of bread. Each loaf requires 2 ¾ cups of flour. How many cups of flour will she need to make all three loaves?

a. 7 ¾ cups
b. 8 cups
c. 8 ¼ cups
d. 8 ½ cups

10. Ashlyn, Collin, Lauren, and Evan are playing a game. The person with the most money in change, gets to keep everyone else's money. Ashlyn has 7 quarters, 3 dimes, 4 nickels, and 6 pennies. Collin has 6 quarters, 4 dimes, 7 nickels, and 2 pennies. Lauren has 8 quarters, 1 nickel, and 2 pennies. Evan has 6 quarters, 3 dimes, 8 nickels, and 8 pennies. Who wins the game?

a. Ashlyn
b. Collin
c. Lauren
d. Evan

11. solve the following equation for x: $5x+12= -3x+60$

a. $x= -4$
b. $x=6$
c. $x=-6$
d. $x=8$

12. Evaluate $(3a)^2$-2b when a=2 and b=4

a. 4
b. 12
c. 28
d. 30

13. One cubic centimeter of pure silver has a mass of 10.5 grams. If one pound corresponds to a mass of 454 grams, what would a 727.9 cubic centimeter bar weigh? round answer to nearest hundredths place

a. 7,642.95 pounds
b. 16.83 pounds
c. 6.55 pounds
d. 65.5 pounds

14. Lauren bought a sweater on sale for $34.99. The original price was $49.99. What was the percent change in the price of the sweater?

a. -30%
b. -43%
c. -70%
d. 43%

15. Find the coordinates of the point located three units to the right of the y-axis and two units above the x-axis?

a. (-3,-2)
b. (3,2)
c. (-2,3)
d. (2,3)

16. Simplify 2x(3x+4) + 3x(2x+1)

a. $6x^2$+5x
b. $12x^2$+11x
c. $12x^2$+5x
d. $12x^2$+5

Next page is the answers, be honest and give that to your teacher☺

1c
2b
3a
4b
5b
6b
7d
8b
9c
10a
11b
12c
13b
14a
15b
16a

More final review of basic math principles Level One *answers at end—do not look!

1. Mike write a check for $318.00. If his balance was then $2126.00, what was his balance before he wrote this check?

a. 808
b 1808
c 2444
d 5306

2. What number multiplied by 6 gives -18 as a result?

a -12
b -3
c 3
d -54

3. $\frac{7.20}{2.4}$=

a 0.03
b 0.30
c 3.00
d 30.00

4. Which of the following best approximates 1.147-114.7

a -100
b -10
c 10
d 100

5. The ratio of winning tickets to tickets sold in the California lottery is 2 to 5. If 3,500,000 tickets are sold, how many are "winners?"

a 700,000
b 750,000
c 1,400,000
d 150

6. $\frac{1+\frac{1}{2}}{1-\frac{3}{4}}=$

a -6
b -2
c 2
d 6

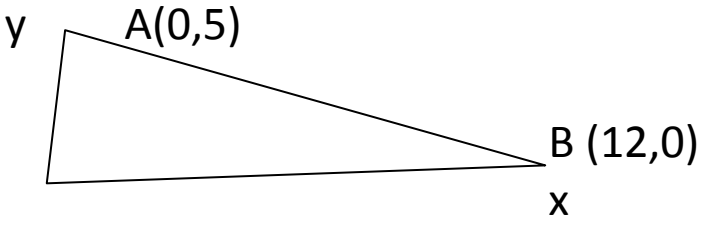
7. If in the formula p=kt, k=36 and p=144, then t=

a ¼
b 4
c 12
d 108

8. 4 (b+2)=

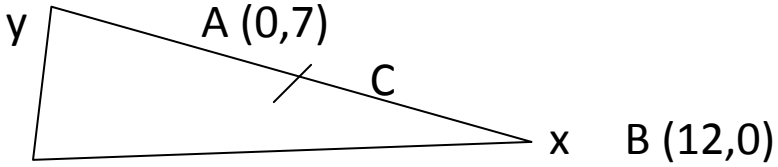
a 4b +2
b b+6
c b+8
d 4b+8

9. In the figure shown, what is the length of segment AB?



a -5
b 5
c 13
d 19

10. If C is the midpoint of segment AB in the figure shown, then the coordinates of C are



a (7/2 * 7/2)
b (6 * 7/2)
c(19/2 * 7/2)
d (19*7/2)

Answers to level one

1 c
2 b
3c
4a
5c
6 d
7 b
8 d
9 c
10 b

level 2 review

1 $(0.12)^2$=

a 0.00144
b 0.0144
c 0.144
d 0.24

2. One of the factors of x^2-x-6 is

a x+3
b x +2
c x-1
d x-2

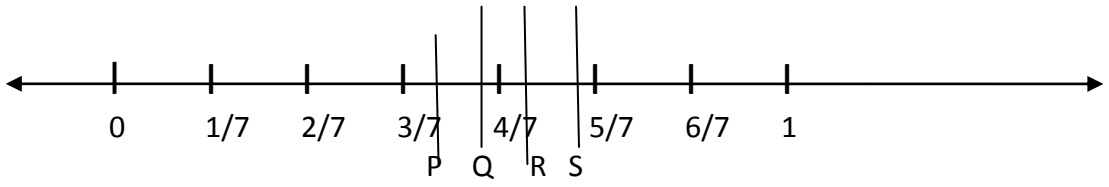
3. If 6x-3 = 8x-9, then x=

a -6
b -3
c 3
d -6/7

4. What are the possible values of x such that $3x^2$-2x=0

a -2/3
b 0 only
c 2/3 only
d 0 and 2/3

5. On the number line below, which letter best locates 5/9



a. P
b. Q
c. R
d. S

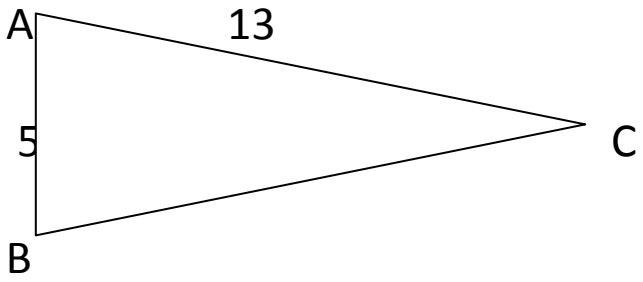
6. $\frac{2}{w+1}$ -- $\frac{1}{w-1}$

a .1/(w+2)
b. 1/ (w^2-1)
c. (w-3)(w^2-1)

7. If X > 0, then $\sqrt{64x^{16}}$=

a. 8 x^4
b. $8x^3$
c . $16x^4$
d. 32 x^4

8. In the right triangle shown below, what is the length of BC?



a. 8
b. 12
c. $\sqrt{18}$
d. 18

9. If x is to 5 as y is to 8, what is the value of x when y=2?

a 5/16
b. 4/5
c. 5/4
d. 16/5

Answers to level 2

1 b
2 b
3 c
4 d
5 b
6 c
7 b
8 b
9 c

Level 3 practice test—intermediate algebra competency test

1. $\frac{c}{d}$+ 2=

a. $\frac{c+2d}{d}$ b. $\frac{c+2}{d+2}$ c $\frac{c+2}{d}$ d $\frac{c+2d}{}$

2. $\frac{c-d}{1/d - 1/c}$=

a) c-d/dc
b) dc/(c-d)
c) cd
d) –cd

3. $\sqrt{3}$ + $\sqrt{27}$ =

a)6
b) $3\sqrt{3}$

c) $4\sqrt{3}$

d) $10\sqrt{3}$

4. If $3x + 2y=8$ and $y=x-1$, then $x=$

a) -6
b)6/5
c) 7/5
d) 2

5. One of the roots of $(x-2)(3x+4)=0$ is

a) -2
b) -4/3
c) -3/4
d) ¾

6. What of the following is an equation of a line slope 3 and a y-intercept -4? y=_____

a) 1/3x-4
b) 3x-4
c) 3x+4
d) 4x+3

7. A student who correctly answered 72 questions on a test, received a score of 75%. How many questions were on the test?
a)54
b)72
c) 75
d)96

Answers to part 3

1. a
2. c
3. c
4. d
5 b
6 b
7 d

For problems 1 & 2, translate using numbers and symbols. Do not simplify.

1. Five times n plus three. 1. _____
2. Six times the sum of x and 2. 2. _____

For problems 3 &4,evaluate for the given number

3. 2a-5b for a=10 and b =1 3._____

4. $\frac{(x+2)}{4}$ for x=6 4._____

5. For problems 5 &6, use the distributive property to simplify.

5 2(y-1) 5._____

6. 5(x+2)-3 6._____

7. Combine like terms: 3x+2x-x 7_____

8. Write the perimeter of the rectangular figure as an algebraic expression then simplify.

4x 8._____

3x+2y

9. Translate into an equation. Do not solve. 9._____

If 3 is multiplied by a number, the result is fifteen

10. Solve and check

x-2=5 10_____

5x=15 11_____

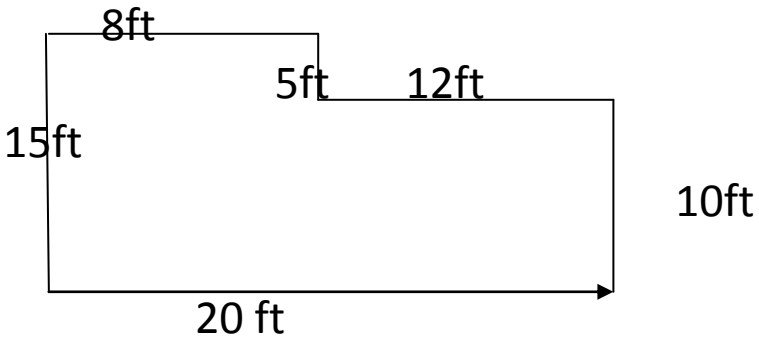
12.Mike and his friends went to the movies. they purchased 2 adult tickets, 5 student tickets, and 2 child tickets. How much did they spend all together?

12_____

Theater ticket prices	
adult	$10
student	$5
child	$2

13. Sarah wants to add a decorative border to her living room. How much feet of the wallpaper border will she need?

13_____



14. Replace the ? with the correct inequality symbol < or >

-6 ?7 14_____

15. Simplify –(-(5)) 15_____

16. State the absolute value /-3/ 16._____

17. 5+(-10) 17_____

18. -2 + (-10) 18_____

19. -5+2+(-3)+4 19_____

20. Evaluate -x+5 for x=2 20_____

21. The temperature at 4 pm was -6F. By 8pm the temperature had dropped another 6 degrees. What was the temperature at 8 pm?

21_____

22. 2-(-3) 22_____

23 2-5 23_____

24. Perform the necessary operations: 24_____
-3 +5- (-1)

25 Evaluate 2+x-y for x = -2 and y=1 25_____

26. Find the difference between a boiling point of 220F and a freezing -45F

26_____

27) 5(-1) 27_____

28) -5(-1) 28_____

29. Determine the sign of the product of the following intergers (positive or negative) do not multiply 29_____

-1(-35)(42)(-210)(27)(3)

30. Multiply 2 (-2)(-5) 30_____

31.) $(-2)^2$ 31_____

32) -2^2 32_____

33) $(-1)^6$ 33_____

34) $(-1)^{13}$ 34_____

35) $\frac{-10}{-2}$ 35_____

36) 15÷(-5) 36_____

37) a=-6 and b=-3 37_____

$\frac{-a}{b}$

38) b^2 solve with above numbers in 37 38_____

39.) -1+5(-2) 39_____

40) 2+3(3-5) 40_____

simplify 41-45

41) 3a-8a 41_____

42) -2x-3x 42_____

43) $3x + (-2x)$ 43_____

44) $-6a-5b-a+2b$ 44_____

45) $-2(a+4)$ 45_____

46) $x-2y$ $x=6$ and $y=-2$ 46_____

47) $\frac{x+y}{2}$ solve with above 47_____

Answers

1) 5n+3
2) 6(x+2)
3) 15
4) 2
5) 2y-2
6) 5x+7
7) 4x
8) 14x +4y
9) 3x= 15
10) x=7
11) x=3
12) $49
13) 70 ft
14) <
15) 5
16) 3
17) -5
18) -12
19) -2
20) 3
21) -12F
22) 4
23) -3
24) 3
25) -1
26) 265F
27) -5
28) 5
29) negative
30) 20
31)4

32) -4
33)1
34)-1
35) 5
36) -3
37) -2
38) 9
39) -11
40) -4
41) -5a
42) -5x
43) x
44) -7a-3b
45) -2a-8
46)10
47)2