Rounding

Look at the place value that instructs you to round to.

EX: Round to the nearest whole #.

312.98 ← I look at the tenths

↑ Whole number

313 because 9 is higher than 5. Get rid of the 8

* DO NOT CHANGE THE 3 or 1

5 or more, raise the score
4 or less, let it rest (leave it alone)
Then get rid of the rest of the numbers

EX. Round to the nearest tenth

312.98 ← hundredth

↑ tenth

+1 ↓

312.0 ~~8~~

313.0

I look at the hundredth it is higher than 5, so I round the 9 to a 10. I put down a zero, keep the zero and carry the one over to the 2. It becomes a 3.

Round to the nearest hundredth

312.983 ← thousandth

↓ hundredth

312.98

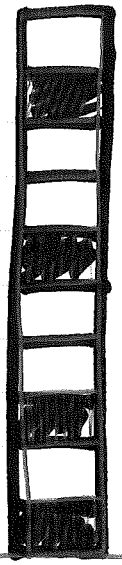
I look at the thousandth. It is less than 5, so I keep the 8 and get rid of the 3

Decimals in Grids

Check to see if the grid is tenths or hundredths.

That will be your bottom number in your fraction.

EX.



Then count the number of squares colored in. That will be your top number in your fraction.

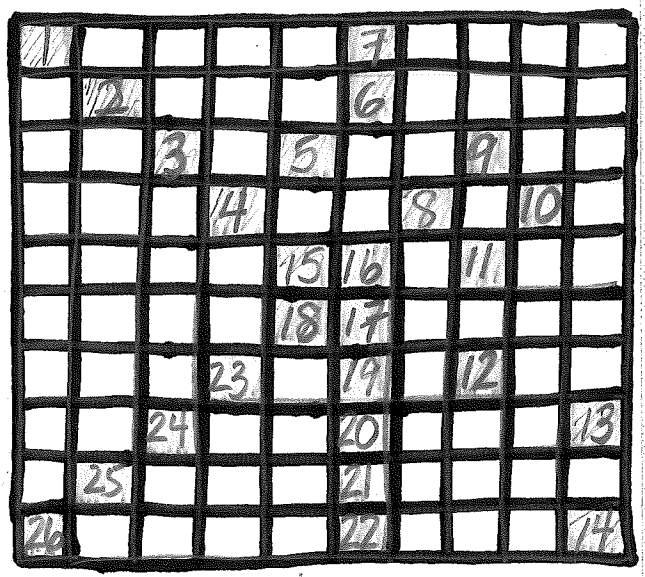
$\frac{4}{10}$ ← numerator
← denominator

IN DECIMAL = .4 ← tenths place → just move the decimal

Check to see if you can simplify it.

$\frac{4 \div 2}{10 \div 2} = \frac{2}{5}$

(If both numbers are even, keep dividing by 2 until it's in the simpliest form)



$\frac{26}{100}$

In Decimal = .26

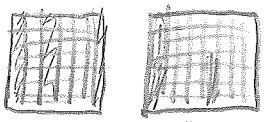
(number the squares as you count them so you don't miscount them)

Simplify

$\frac{26 \div 2}{100 \div 2} = \frac{13}{50}$

* If you need to find the difference between two grids. First get the fractions. Then subtract. Then simplify.

EX:



$\frac{30}{100} - \frac{15}{100} = \frac{15}{100} \div 5 = \frac{3}{20}$

.30 - .15 = .15

hundredths place - just move the decimal

* see notes on simplifying fractions if you don't remember

Moving decimals and powers of 10.

Scientific notation
- replaces place value (usually zeros) with an exponent

Ex. $56{,}000 \rightarrow 5.6 \times 10^{4}$ ← That is an exponent

- move the decimal to the right for multiply
- move the decimal to the left for division

Ex. $3.2 \times 10^{3} \rightarrow 3200$ (Fill with zeros) $= 3200$

Ex. $3.2 \div 10^{3} \rightarrow .0032$ (Fill with zeros)

Decide if the equation is division or multiplication.

$6.15 = 615.0$ is this $\times$ or $\div$?

6.15 → it is multiply

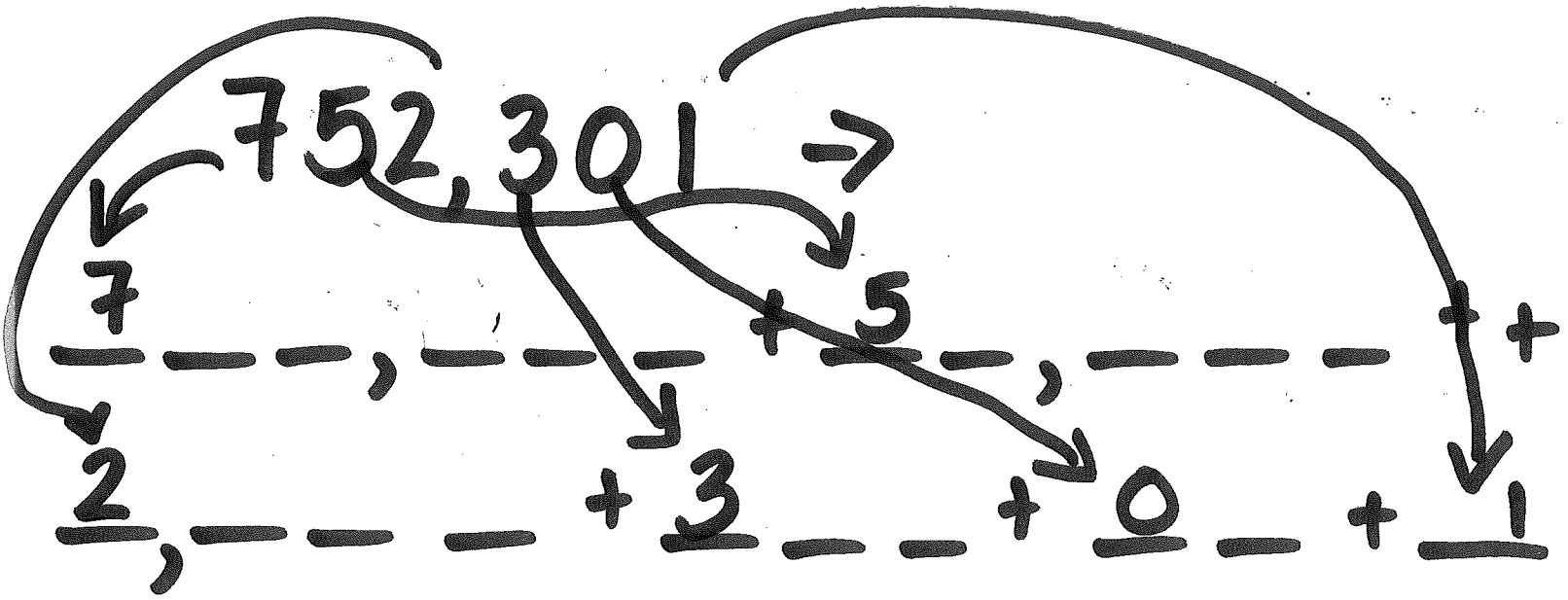
because $6.15 \times 10^2 = 615.00$

.615 → can be written as

$6.15 \div 10^1$ → 6.15 move 1 place to the left

$61.5 \div 10^2$ → 61.5 move 2 places to the left

Expanded form with decimals and whole #'s



Fill in the remaining spaces with zeros

Count place value and put spaces for that number. Ex 3212

____ for 3000 __ for 10

___ for 200 _ for 2

expanded form with decimals

321.98

tenths hundredths

$\frac{1}{10}$ $\frac{1}{100}$

So

$300 + 20 + 1 + (9 \times \frac{1}{10}) + (8 \times \frac{1}{100})$

- Put each decimal place over the place value = EX.

because $\frac{9}{1} \times \frac{1}{10} = \frac{9}{10} = .9$

$\frac{1}{10}$ $\frac{1}{100}$ $\frac{1}{1000}$ $\frac{1}{10,000}$

put the whole # and x by the fraction

WHEN DO I?

ADD +

When getting the SUM, TOTAL, IN ALL

The # gets BIGGER

SUBTRACT -

WHEN getting the DIFFERENCE, LEFT OVER, REMAINS

The # gets SMALLER

MULTIPLY x

When getting the total, in all of BIG numbers.

The # gets bigger. Multiplication is repeated addition.

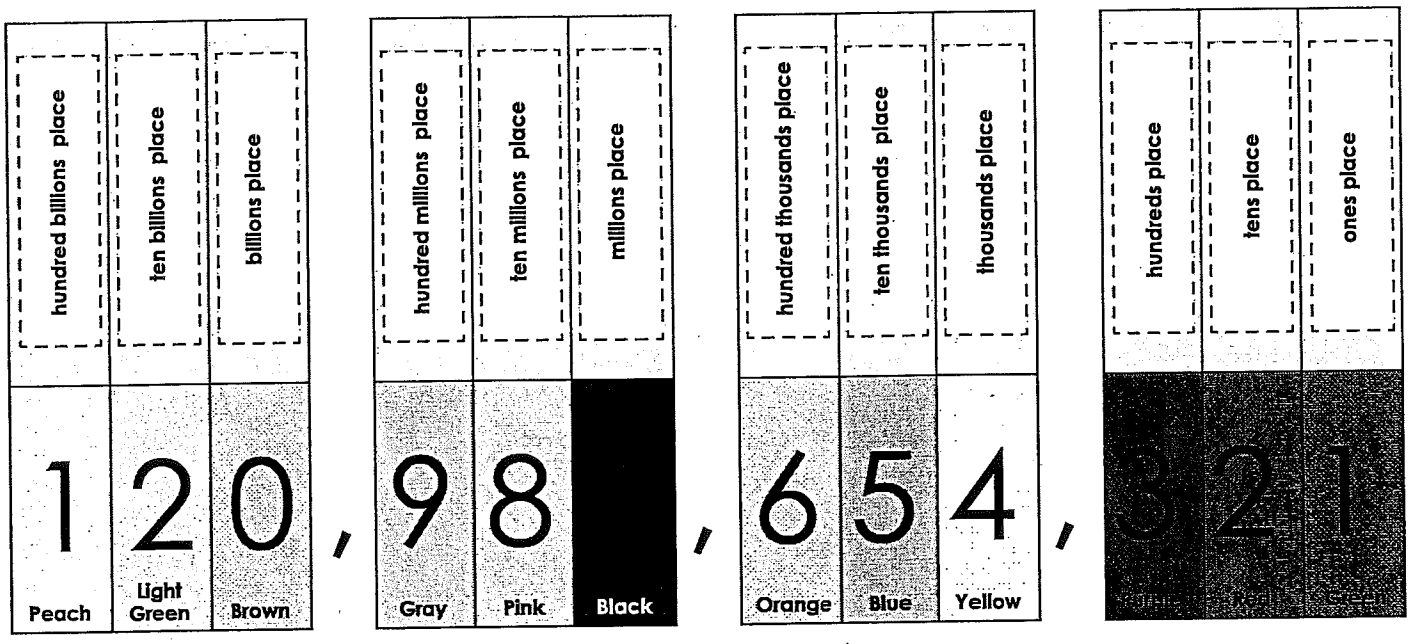
DIVIDE ÷

When getting EACH, EQUAL GROUPS, How many can fit?

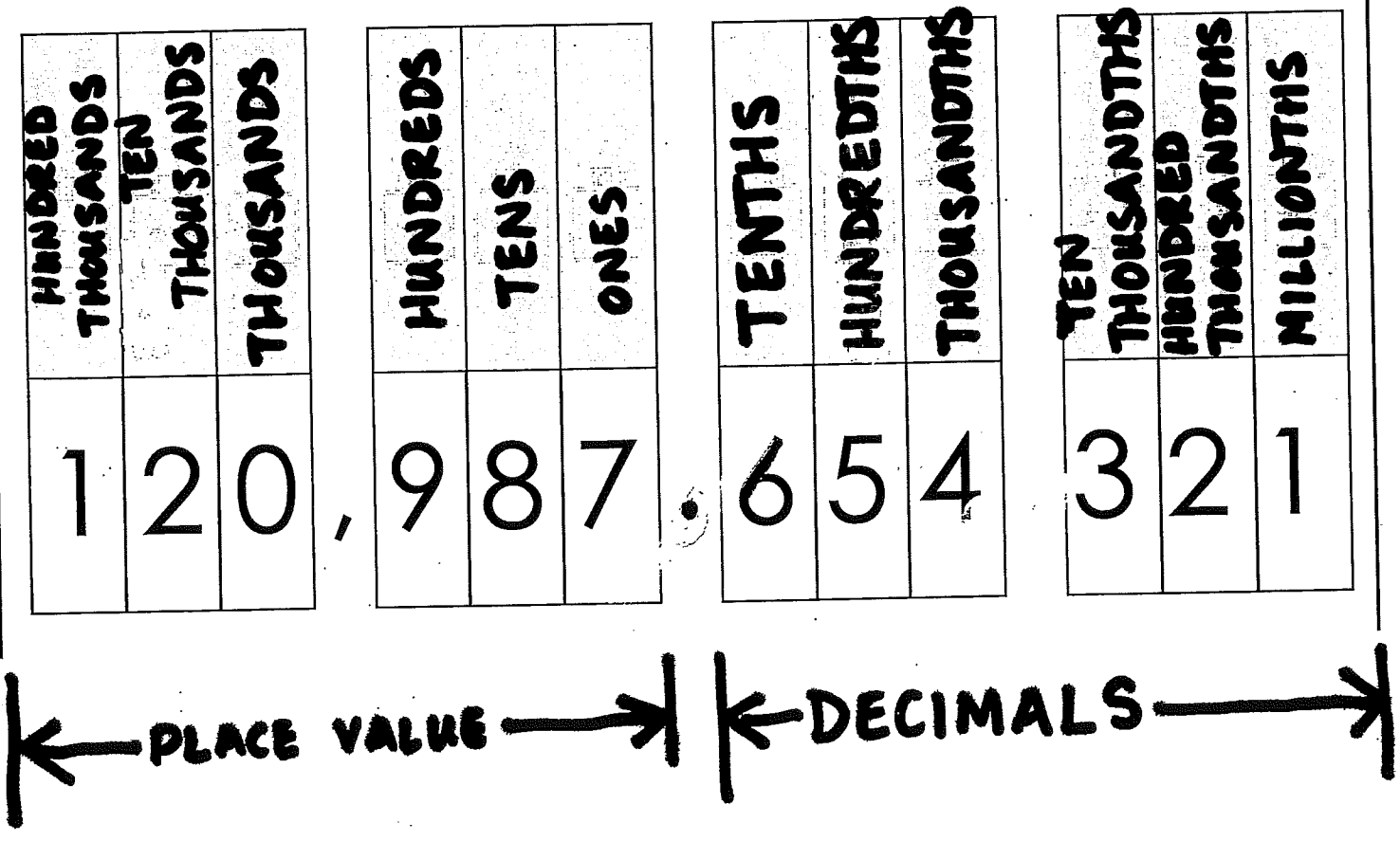
The # gets smaller. Division is repeated subtraction.

the set of whole numbers (both positive and negative) and zero. integer		Four regions into which a coordinate plane is divided by the x-axis and the y-axis, labeled in Roman Numerals quadrants
Numbers designated as either negative or positive by prefixing the number with either a (–) or a (+). signed numbers		Going straight across from side to side horizontal
going straight up and down vertical		the distance a number is from zero; symbol is / /. absolute value

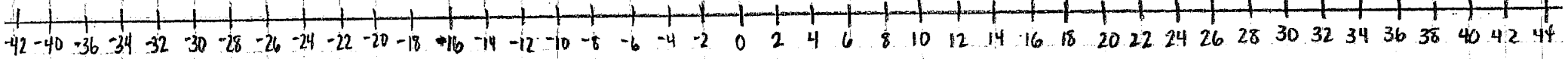
Place Value

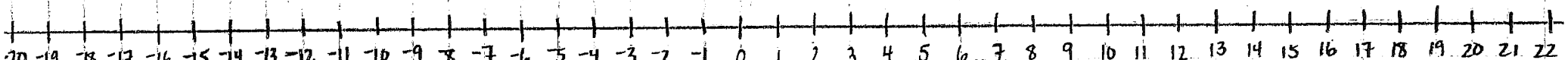


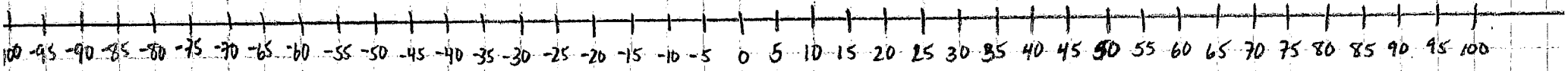
Place Value



NUMBERLINE


-42 -40 -36 -34 -32 -30 -28 -26 -24 -22 -20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44


-20 -19 -18 -17 -16 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

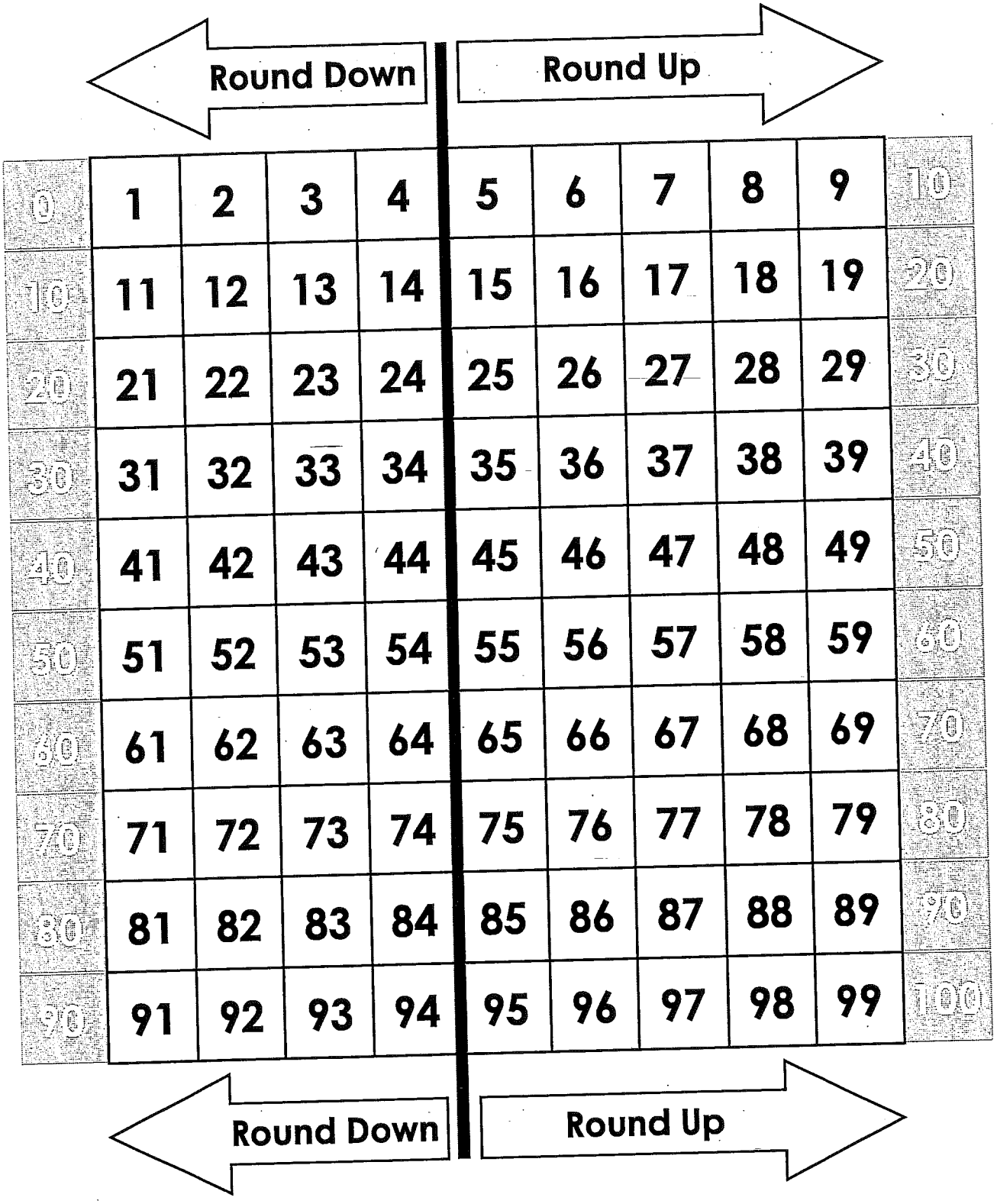

-100 -95 -90 -85 -80 -75 -70 -65 -60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Fraction Strips

1 Whole											
$\frac{1}{2}$	$\frac{1}{2}$										
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$									
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$								
$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$							
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$						
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$				
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$		
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

Name: _____

Hundreds Chart for Rounding



DECIMALS

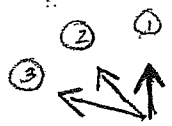
MULTIPLYING

DO NOT HAVE TO LINE THEM UP!

EX.

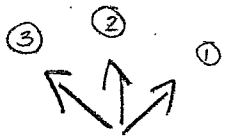
$$\begin{array}{r} 2.56 \\ \times \quad 12 \\ \hline 512 \end{array}$$

MULTIPLY



First row in this pattern

$$\begin{array}{r} 2.56 \\ \times \quad 12 \\ \hline 512 \\ 0 \end{array}$$



← Put a zero here now multiply →

SO

$$\begin{array}{r} 2.56 \\ \times \quad 12 \\ \hline 512 \\ + \; 2560 \\ \hline \end{array}$$

NOW ADD

↓

3072

NOW MOVE THE DECIMAL FROM RIGHT (COUNT HOW MANY DIGITS THERE ARE AFTER THE DECIMAL)

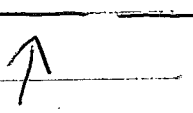
2.(56) There are 2 digits after the decimal

30.72

THE ANSWER IS 30.72 ← SO

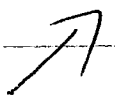
Comparing decimals

Look at the place value starting with the tenths place



If that number is bigger than the next number, it is a greater value

Ex. 5.8 4 3 verses 5.9



This one is bigger than 8 so it has a greater value even though there are less digits

Volume =

$l \times w \times h = \text{volume}$

multiply all 3 sides to get Volume ^{3}

Volume = the amount of space something takes up.

formula =

length x width x height

OR

l x w x h = volume ③

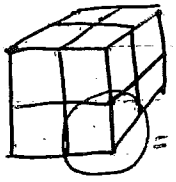
l side l side l side — there are 3 sides

Ex = l = 2
w = 3
h = 3
> put this in a formula

l x w x h = v
2 x 3 x 3 =
6 x 3 = 18 cubic inches

Count cubes

 = 1 cm^3

 = 8 cubic units
= 1 cube

- DIVIDING RULES -

$$\begin{array}{r} 005 \\ 22\overline{)112} \\ -110 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 22 \\ \times\ 5 \\ \hline 110 \end{array}$$

1. How many times will the outside (divisor) fit without going over?

2. The remainder or number after subtracting can't be bigger than the divisor.

ex. $22\overline{)112}$ → 2 → 44 → 68 (crossed out)

bigger so this is WRONG!

EX. $13\overline{)5322}$ How many times does 13 fit into the first #?

$13\overline{)5322}$ → 0 (13 into 5?)

$13\overline{)5322.0}$ → 409.3 (13 into 53?)

$$\begin{array}{r} 409.3 \\ 13\overline{)5322.0} \\ -52\downarrow \\ \hline 12 \\ -0\downarrow \\ \hline 122 \\ -117\uparrow \\ \hline 50 \\ -36 \\ \hline 14 \end{array}$$

multiply $4 \times 13 = 52$ then put under 53 and subtract

Now bring down 2

See how many times 13 goes into 12 (zero) then $13 \times 0 = 0$

So subtract 0 from 12

Now bring down the next 2

How many times does 13 go into 122?

9 times (117) - put under 122 and subtract

$$\begin{array}{r} 122 \\ -117 \\ \hline 5 \end{array}$$

Bring down a zero, put a decimal after the whole # and divide 13 into 50 is 3

Answer is 409.3

LONG DIVISION
NO REMAINDERS!

$5\overline{)8923}$

$5\overline{)8923.00}$ PLACE A DECIMAL AFTER THE WHOLE NUMBER AND TWO ZEROS!

$$\begin{array}{r} 1 \\ 5\overline{)8923.00} \\ -5\downarrow \\ \hline 3 \end{array}$$

1. 5 INTO 8, 1 TIME, $5 \times 1 = 5$
2. SUBTRACT $8 - 5 = 3$
3. BRING DOWN 9
4. 5 INTO 39, 7 TIMES, $5 \times 7 = 35$

$$\begin{array}{r} 17 \\ 5\overline{)8923.00} \\ 5 \\ \hline 39 \\ -35\downarrow \\ \hline 42 \\ -40 \\ \hline 23 \\ -20 \\ \hline 30 \end{array}$$

5. BRING DOWN 2
6. 5 INTO 42, 8 TIMES, $8 \times 5 = 40$
7. BRING DOWN 3
8. 5 INTO 23 4 TIMES, $4 \times 5 = 20$
9. BRING DOWN 0

ADD UNLIKE FRACTIONS

Find a common denominator - or LCM

$\frac{2}{7} = \frac{}{21}$ Figure out how to get from 7 to 21

Figure out how to get from

$+ \frac{1}{3} = \frac{}{21}$ ← 3 to 21

LCM: 7 = 7, 14, (21)

Skip count 3 = 3, 6, 9, 12, 15, 18, (21)

$\frac{2 \times 3}{7 \times 3} = \frac{6}{21}$

$\frac{1 \times 7}{3 \times 7} = \frac{7}{21}$

ADD $6 + 7 = \frac{13}{21}$

KEEP THE DENOMINATOR

* Whatever you multiply the bottom # by, you must multiply the top #!

$\frac{1 \times 7}{3 \times 7} = \frac{7}{21}$

ADD MIXED NUMBERS WITH FRACTIONS

$3\frac{1 \times 5}{3 \times 5} = \frac{5}{15}$

$+ \quad 5\frac{2 \times 3}{5 \times 3} = \frac{6}{15}$

DO NOT ADD WHOLE NUMBERS YET!

FIND common denominator of 3 + 5

3 = 3, 6, 9, 12, 15

5 = 5, 10, 15

ADD $\frac{5+6}{15} = \frac{11}{15}$

NOW ADD WHOLE NUMBERS

$8\frac{11}{15}$

SUBTRACT FRACTIONS WITH REGROUPING

EX. $4 - 3\frac{3}{4}$

Re-write in column form

$$\begin{array}{r} 4 \\ -\ 3\ \frac{3}{4} \\ \hline \end{array}$$

The answer IS NOT $1\frac{3}{4}$.

BORROW FROM THE 4

$$\begin{array}{r} 3\ \ \ 1 \\ \not{4} \\ -\ 3\ \frac{3}{4} \\ \hline \end{array}$$

NOW TURN THE 1 into a fraction using the denominator from the problem

$$\begin{array}{r} 3\ \frac{4}{4} \\ -\ 3\ \frac{3}{4} \\ \hline 0\ \frac{1}{4} \end{array}$$

I used $\frac{4}{4}$ because it is the same as 1 whole (which I borrowed from 4)

SUBTRACT FRACTIONS WITH REGROUPING

EX. $5\frac{1}{9}$

$-\ 3\frac{4}{9}$

BORROW FROM THE 5

$4\ \frac{10}{9}$

$5\ \frac{1}{9}$

NOW GIVE 1 WHOLE TO $\frac{1}{9}$

$-\ 3\frac{4}{9}$

SINCE THE DENOMINATOR IS 9, THEN USE $\frac{9}{9}$ to EQUAL 1 WHOLE SO...

$4\ \frac{1}{9}+\frac{9}{9}=\frac{10}{9}$

$-\ 3\ \frac{4}{9}$ $\quad\frac{4}{9}$

NOW SUBTRACT! RIGHT TO LEFT

$1\ \frac{6}{9}$ → NOW SIMPLIFY

$\frac{6\div3}{9\div3}\ \frac{2}{3}$ → $1\frac{2}{3}$

(because 3 is a factor of 9)

LCM - Least Common Multiple

EX. 36 = 36, 72, 108

24 = 24, 48, 72

GCF - Greatest Common Factor

LIST THE FACTORS OF THE NUMBER

EX. 18 = 2, 3, 6, 9

24 = 2, 3, 4, 6, 8, 12

THIS IS THE BIGGEST FACTOR THEY BOTH HAVE

LCF - Least Common Factor

LIST THE FACTORS

EX. 9 - 3

THIS IS ALSO THE GCF

18 - 2, 3, 6, 9

EX. 20 - 2, 4, 5, 10

35 - 5, 7

FIND THE COMMON DENOMINATOR

Ex. $\frac{4}{9} + \frac{5}{8}$

Re-write

$\frac{4}{9}$

$+$

$\frac{5}{8}$

LIST LCM

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

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

THE LCM = 72

$\frac{4 \times 8}{9 \times 8} = \frac{32}{72}$

$+$

$\frac{5 \times 9}{8 \times 9} = \frac{45}{72}$

IF MULTIPLY BOTTOM BY A NUMBER - MUST MULTIPLY TOP BY THE SAME NUMBER

$\frac{80}{72}$

$\frac{80 \div 8}{72 \div 8} = \frac{10}{9}$

NOW SIMPLIFY
(IF YOU DON'T KNOW WHERE TO START, DIVIDE BY 2 IF BOTH NUMBERS ARE EVEN. THEN KEEP DIVIDING BY 2)

Convert Decimals to Fractions

(1) Look at the decimal

Ex. 7.8

(2) Keep whole # = 7

(3) Look at PLACE VALUE for decimal = .8

↓

tenths

(4) Place over 10 for tenths or over 100 for hundredths or 1000 for thousandths

$\frac{8}{10}$

(5) → Then place whole # in front of fraction

$7\frac{8}{10}$ → can simplify

$\frac{8 \div 2}{10 \div 2} = \frac{4}{5}$ → $7\frac{4}{5}$

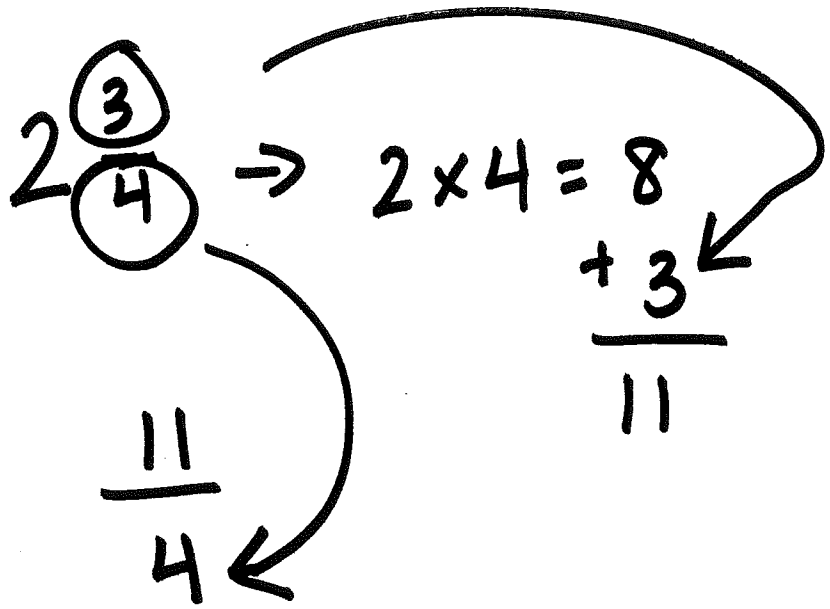
If it's .25, .50, .75 → think in terms of money 1 quarter out of 4 →

$\frac{1}{4} = .25$

Convert Mixed Numbers

Multiply the whole # by the denominator. Then add that to the numerator. Place this new # over the original denominator.

Ex: $2\frac{3}{4}$ → $2 \times 4 = 8$, $8 + 3 = 11$, $\frac{11}{4}$



Multiply Fractions

EX. $\frac{1}{2} \times \frac{2}{5}$

Multiply STRAIGHT across for the TOP and BOTTOM

$\frac{1}{2} \times \frac{2}{5} = \frac{1 \times 2}{2 \times 5} = \frac{2}{10} = \frac{2}{10}$ then Simplify

See what goes into both #'s (a multiple)
* hint: if it is both EVEN numbers, divide both by 2

$\frac{2 \div 2}{10 \div 2} = \frac{1}{5}$ Answer is $\frac{1}{5}$

What ever you divide the top by, multiply the bottom by =

EX $\frac{5}{25} \frac{\div 5}{\div 5} = \frac{1}{5}$ (because 5 is a multiple of 25)

*** YOU CANNOT MULTIPLY WHOLE #'s with FRACTIONS (MIXED #'s). You must Convert First!**

$2\frac{1}{2} \times 2\frac{1}{2} = \frac{5}{2} \times \frac{5}{2} = \frac{25}{4} \rightarrow$ Simplify $6\frac{1}{4}$

$2 \times 2 + 1 = \frac{5}{2}$ $\quad$ $2 \times 2 + 1 = \frac{5}{2}$ improper fraction (See improper notes)

MULTIPLY FRACTIONS

Multiply straight across

EX. $\frac{3}{5} \times \frac{2}{5} = \frac{6}{25}$

If there is a whole number, place over 1

$\frac{3}{5} \times 6 = \frac{3}{5} \times \frac{6}{1} = \frac{18}{5}$

then change into mixed #

Multiply fractions

(1) Convert any mixed numbers to improper fractions

(2) Line up horizontally

ex: $\frac{14}{5} \times \frac{3}{2}$

(3) Multiply Straight across

$\frac{14}{5} \times \frac{3}{2} \rightarrow \frac{14 \times 3}{5 \times 2} = \frac{42}{10} = \frac{42}{10}$

(4) Simplify

$\frac{42}{10} \rightarrow 10\overline{)42}$ $4\frac{2}{10} \rightarrow 4\frac{1}{5}$

40

2

SIMPLIFY FRACTIONS

IF IT IS EVEN FOR NUMERATOR AND DENOMINATOR, IT IS DIVISIBLE BY 2! KEEP DIVIDING UNTIL YOU CAN'T ANY MORE

EX. $\frac{24 \div 2}{36 \div 2} = \frac{12 \div 2}{18 \div 2} = \frac{6}{9}$

↖ BUT NOW 3, IT IS A MULTIPLE OF 9

SO

$\frac{6 \div 3}{9 \div 3} = \frac{2}{3}$

IF YOU DIVIDE THE BOTTOM # by SOMETHING, (#) MUST DIVIDE TOP BY SAME #!

EX. $\frac{50 \div 50}{100 \div 50} = \frac{1}{2}$

FRACTIONS

TO MAKE ANY WHOLE NUMBER INTO A FRACTION PLACE THAT NUMBER OVER 1

EX. $\frac{6}{1} = 6$ wholes

Why? $1\overline{)6} = 6$

The TOP # is ALWAYS divided by the bottom #.

TO MAKE 1 WHOLE INTO A FRACTION

LOOK AT DENOMINATOR AND THEN

PLACE SAME # ON TOP & BOTTOM

EX. $\frac{6}{6} = 1$ whole

WHY? BECAUSE $6\overline{)6} = 1$

$\frac{101}{101} = 1$ $\frac{9}{9} = 1$ $\frac{3}{3} = 1$ $\frac{1087}{1087} = 1$

IMPROPER FRACTIONS

$$\frac{23}{7}$$

SEE HOW MANY TIMES THE DENOMINATOR GOES INTO THE NUMERATOR

1. SEE HOW MANY TIMES 7 GOES INTO 23.

$7\overline{)23}$ ③ BECAUSE $3 \times 7 = 21$

THIS BECOMES THE WHOLE NUMBER

2. SUBTRACT THE DIFFERENCE

$$\begin{array}{r} 23 \\ -\,21 \\ \hline 2 \end{array}$$

3. PLACE THE DIFFERENCE OVER THE DENOMINATOR

$\frac{2}{7}$ → 7 is the denominator

4. The MIXED number is:

$$3\frac{2}{7} = \left(\frac{23}{7}\right)$$

Order of Operations

Tells us the correct order for performing mathematical operations

P	Parentheses	(when there are terms added/subtracted in between parentheses) $(8-6)$ ↓ 2
E	Exponents	2^3 $(2 \times 2 \times 2 = 8)$
M/D	Multiplication/Division	Whichever comes first, left to right
A/S	Addition/Subtraction	Whichever comes first, left to right

Definitions of 2-D shapes

Square = a square is a rectangle with sides of EQUAL length and four right angles

Rectangle = having four right angles

Rhombus = quadrilateral with four sides of equal length (but not right angles)

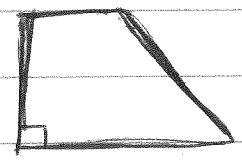
Diamond = four straight sides of equal length forming 2 opposite acute angles and two opposite obtuse angles (also a rhombus)

Parallelogram when cut diagnolly forms 2 equivalent triangles (opposite angles will add up to 180°)

Trapezoid = no lines of symetry

1 parallel set of lines (base, + base$_2$)

Can be a right angle trapezoid



CONVERTING MEASUREMENT IN TABLE FORM

Place the unit YOU ARE starting with

Example: Convert inches to yards

48 inches to yards

I start with inches

$$\frac{48\ (in.)}{1} \cdot \frac{\quad}{\quad}$$

(over 1) ↑ ↑ times

The units to be canceled (converted from) must be diagnol from each other to be able to be crossed out.

$$\frac{48\ \cancel{in}}{1} \cdot \frac{1\ \cancel{ft}}{12\ \cancel{in}} \cdot \frac{1\ yd}{3\ \cancel{ft}}$$

KEEP crossing out until you are left with the unit you went to end up with

TOP: Multiply straight across
BOTTOM: Multiply straight across

$$\frac{48\ in.}{1} \cdot \frac{1\ ft}{12\ in} \cdot \frac{1\ yd}{3\ ft} \rightarrow \frac{48 \cdot 1 \cdot 1}{1 \cdot 12 \cdot 3} = \frac{48}{36} \rightarrow$$ Simplify

$$36\overline{)48} \quad 1\ \tfrac{12}{36}$$
$$\underline{36}$$
$$12$$

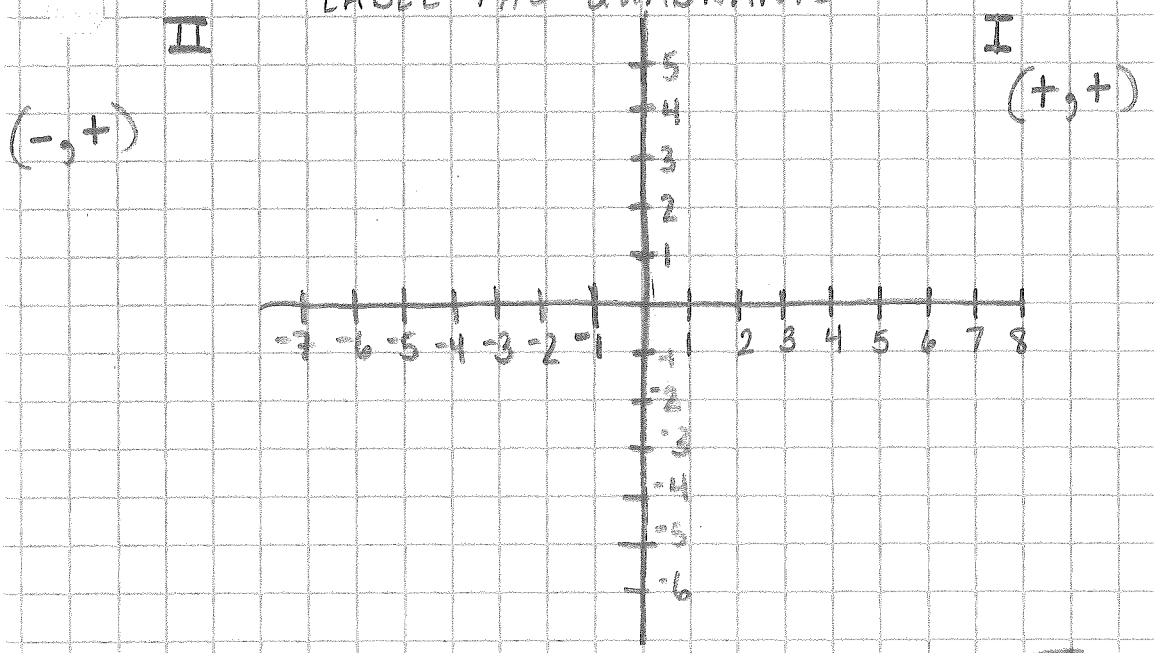
$1\frac{1}{3}$ yd.

NOTE

This process will work for converting any measurement even standard to metric and metric to standard.

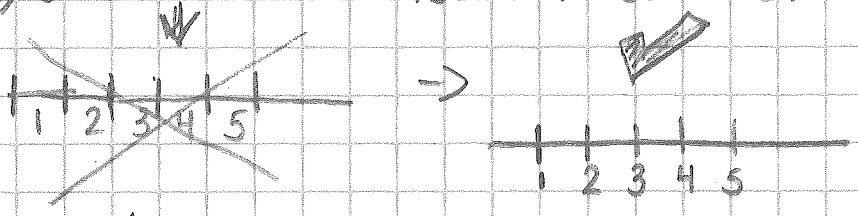
GRAPHING COORDINATE PAIRS

LABEL THE QUADRANTS



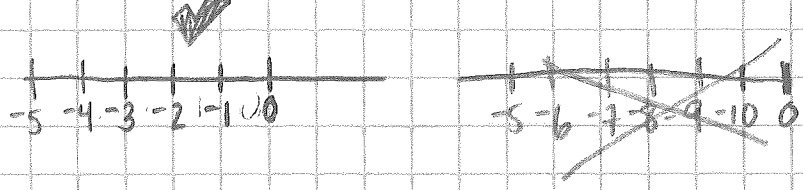
① LABEL THE X + Y AXIS

② DO NOT PUT NUMBERS IN BETWEEN LINES



BAR GRAPHS LINE GRAPHS

③ When labeling negative numbers, start at zero and then count up from one on the right



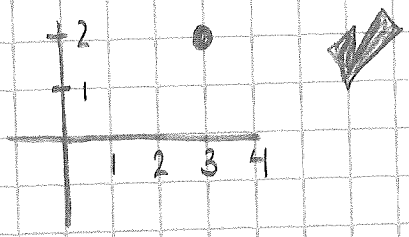
PLOT X and then Y

X is horizontal ←→

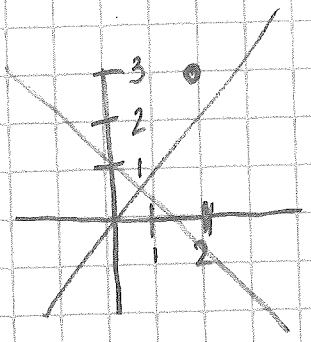
Y is verticle ↕

EXAMPLE

(3,2) OVER 3 then up 2



NOT up 3 over 2



NAME THE POINTS LIKE A, B, C, D, E

then list coordinate pairs = P_A (P is point subscript A is point A)

$P_A = (3,2)$

$P_B = (4,2)$

Right angles = 90° (squares, rectangles)

Acute = less than 90°

Obtuse = more than 90°

Vertice = point at which 2 lines meet

COMPARING RATIOS

WITH = add

Old Chickens with Ugly Goats with Bad Ponies means Add ALL these numbers together

120 + 6 + 12 = 138

AND TOTAL number of animals

Add up ALL animals = 245

THEN $138:245$, $\frac{138}{245}$, 138 to 245

For every 138 chicken, goat, and pony there are 245 TOTAL animals.

RATIOS

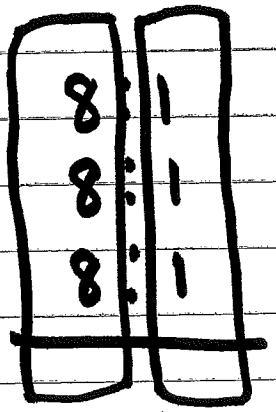
USE TABLES TO FIGURE OUT AMOUNT PER → CANNOT ALWAYS DIVIDE!

WHITE RED

8 CUPS TO 1 CUP. TOTAL OF 27 CUPS. HOW MUCH RED?

SET 1 = 8 : 1 → 8 + 1 = 9
SET 2 = 8 : 1 → 8 + 1 = 9 > 18
SET 3 = 8 : 1 → 8 + 1 = 9 +9
27

NOW BOX OFF THE CUPS USED AND ADD



24 : 3
W R

SO 3 CUPS OF RED

UNIT RATES

TO FIND OUT A NUMBER PER UNIT ALWAYS DIVIDE!

HOW MUCH DOES IT COST PER MINUTE?

A 7.99 DOG TOY LASTED FOR 15 MINUTES. WHAT WAS THE COST PER MINUTE?

$$
\begin{array}{r}
.53 \\
15\overline{)7.99} \\
75\downarrow \\
\hline
49 \\
45 \\
\hline
4
\end{array}
$$

.53 per minute

* CANNOT DIVIDE EVENLY WHEN DEALING WITH TIME BECAUSE ITS ON A 60 MIN. SCALE NOT 100.

EX. $120 MINUTES COST $60

HOW MUCH PER HOUR?

1 hr: $30
1 hr: $30 } 60

60 MIN
+ 60 MIN } 2 HRS.
120 min

UNIT RATES

MUST USE A UNIT WHEN ASKS YOU TO WRITE AS A UNIT RATE.

EX. 5 donuts cost 20 dollars. Write as a unit rate.

$$\frac{5 \text{ donuts}}{20 \text{ dollars}} \quad \text{or} \quad \frac{1 \text{ donut}}{4 \text{ dollars}}$$

Because it is #4 per donut

ALWAYS SIMPLIFY!

Integers (Adding)

absolute value = | | (uses these lines)

anything in these | | are always positive

So $|-8| = 8$ or $|-233| = 233$ ← rational number

$|8| = 8$ $|233| = 233$

If a negative is outside the | | then put it in front of the rational number

So $-|-8| = -8$ or $-|-233| = -233$

$-|8| = -8$ $-|233| = -233$

If you have two - - in a row → they become positive $--8 = +8$

If adding = $-8 - 8$ → change to $-8 + \bar{8} = -16$

$-8 + 5 \rightarrow -3$ (subtract)

bigger number keeps the sign

Rules of adding integers

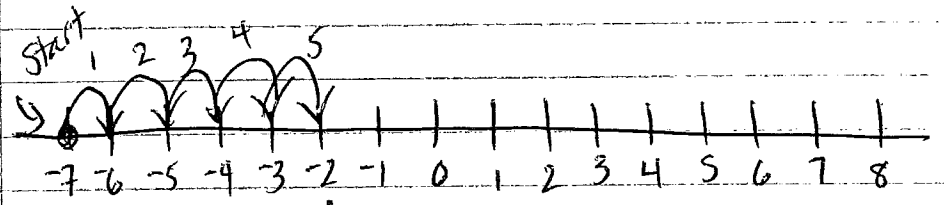
EX

$15 - 8 \rightarrow 15 + \overline{-}8 = 7$

$-17 + 5 \rightarrow -17 + 5 = -12$

We always say adding and need to change so signs.

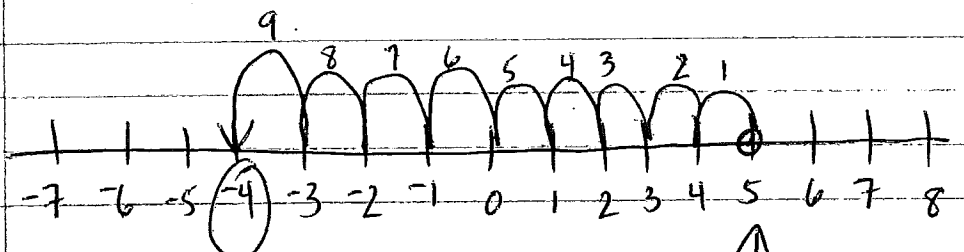
Can do this on a numberline too:



-7

answer is -2

$-7 + 5 = -2$



END

answer is -4

$5 - 9$

Start at 5

Start

take away 9

If the variable is not in <u>both</u> then leave it alone!

EXAMPLE 1

$25x^3y^3 + 125x^2y^2$

(Look for what they have in common!)

They both are multiples of 25

There is an x in $25x^3y^3$

There is an x in $125x^2y^2$

There is a y in $25x^3y^3$

There is a y in $125x^2y^2$

I pull out a 25 from 25 and 125

I pull out 2 x's from $25x^3 + 125x^2$

I pull out 2 y's from $25y^2 + 125y^2$

I put $25x^2y^2$ in front of my ( )

$= 25x^2y^2(xy + 25)$

* $x^3 - x^2 = x$

$y^3 - y^2 = y$ That's where I get (xy)

EXAMPLE 2

$10x^2y^2 - 30x$

10 and 30 are multiples

There is an x in $10x^2y^2$

There is an x in 30x

I pull out 1x from $10x^2y^2$ and 30x because 30x only has 1 x

I put 10x in front of my ( )

$= 10x(xy^2 - 30)$

Graphing inequalities

$x \leq 8$

this will 'point' to the direction you color the line in.

Color in the arrow at the correct end.

label ALL numbers on line, DO NOT skip numbers, follow the pattern for whatever interval you choose

ex: interval 2 graph ≤ 13

this line means equal to so color in the circle.

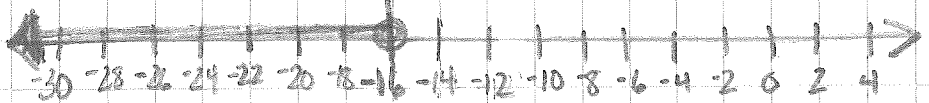
This is 13, I cannot just put 13 as an interval I must see where it falls on the numberline and put my circle.

If you have $x \leq (-8 - 8)$ Solve first in parenthesis

$-8 + -8 = -16$

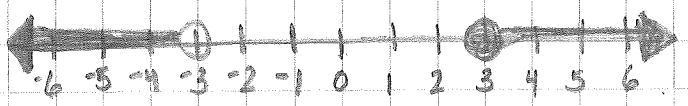
it becomes $x \leq -16$

Graph it now:



- Graphing inequalities

Graph $x \geq 3$ $x < -3$



$6 \leq 16$ (there is no x)

↓

this will be 1 set of #

Closed circle because it's underlined

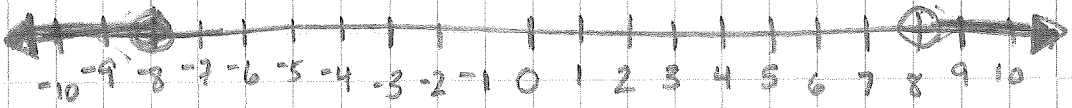
Color the line in between the #'s

No to the arrows

Graph

$x < (-15+7)$ $x > (15-7)$ → $15 \overline{+7}$

↓ Solve = -8 ↓ Solve = 8



- can not use the letter x anymore because it looks like a variable
- coefficient should always be in front of the variable
  - ↓
  - is the number, not the letter
- expression means DO NOT SOLVE
  - ↳ put in a formula
  - ↳ why? → because it is a general format → to use with any #
- If a number is next to a letter, then the order of operation is multiply

equation means that you CAN SOLVE it -
- → sometimes put in the number for the variable and SOLVE

- parenthesis → use to seperate PARTS of an expression or equation.

[in language arts → expression is like maybe + equation is either YES OR NO]

- Distributive Property is like the (fairness game)
  - → what I give to one, I must give to the other

ex. $b(3+5)$

multiply b times 3

multiply b times 5

then I get $(b)(3)$ $(b)(5)$

the letter goes AFTER the number → $3b$ $5b$

then I put in my sign of +

- keep the same variable in order to combine them and SOLVE
  - so I can't have $j + l + c$ because each letter stands for a number
-

6th

UNIT 4

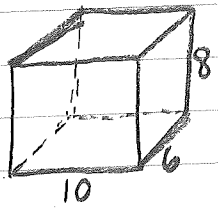
Finding The Surface Area of 3-D shapes

(1) Determine how many faces the shape has.

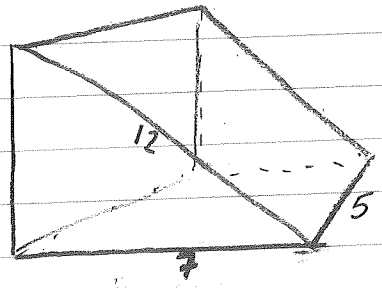
Ex = Rectangular Prism has 6 faces
Ex, = A triangular Prism has 5 faces

(2) Sketch the shape

Ex,



6 faces



5 faces

(3) USE THIS FORMAT! A = area l × w

6 FACES:

$Top_A = (10 \times 6) = 60$
$Bottom_A = (10 \times 6) = 60$ > 120
$Side_1 = (6 \times 8) = 48$
$Side_2 = (6 \times 8) = 48$ > 96
$Front_A = (10 \times 8) = 80$
$Back_A = (10 \times 8) = 80$ > 160
NOW ADD! 376 units²

Each measurement should be used TWICE because there is two of each of the SAME areas. Use all numbers and pair them differently. (See Above example)

* Should Be in (UNITS²) !!

5 FACES

$Top_A = (5 \cdot 12) = 60$
$Base_A = (7 \cdot 5) = 35$ > 95
$Side_1 = \left(\frac{9 \cdot 7}{2}\right) = 31.5$
$Side_2 = \left(\frac{9 \cdot 7}{2}\right) = 31.5$ > 63
$Back = (9 \cdot 5) = 45$ 45
203 units²

Remember to use the formula for a triangle for the sides

$\frac{b \cdot h}{2} = Side_1$ $\frac{b \cdot h}{2} = Side_2$

* You will only use the hypotenuse (slanted side) once in your TOP area measurement!

6th Unit 4

FINDING HOW MUCH VOLUME FITS IN A 3-D SHAPE

(1) Find the TOTAL volume for the 3-D shape

EX: $l = 4.9$ ft $w = 2.8$ ft. $h = 3.6$ ft

$l \times w \times h$ = Volume

$4.9 \times 2.8 \times 3.6 =$

$$\begin{array}{r} {}^{7}4.9 \\ \times\ 2.8 \\ \hline 392 \\ 980 \\ \hline 13.72 \end{array} \qquad \begin{array}{r} {}^{4}\ {}^{2}13.72 \\ \times\ \ 3.6 \\ \hline 8232 \\ 41160 \\ \hline 49.392\ ft^3 \end{array}$$

Convert to in

49.392×12

592.704 in

Only convert if the units are different like feet and inches. If both are in feet or inches, just divide at end.

(2) How many of each size box will fit into the larger crate?

Box 1: $l = 8"$ $w = 4"$ $h = 3.5"$

Box 2: $l = 7.6"$ $w = 5"$ $h = 4"$

Find Volume of EACH

Box 1 = $8 \cdot 4 \cdot 3.5 \rightarrow$

$$\begin{array}{r} {}^{1}32 \\ \times\ 3.5 \\ \hline 160 \\ 960 \\ \hline 112.0 \end{array} \rightarrow 112.0\ in^3$$

Box 2 = $7.6 \times 5 \times 4$

20

$$\begin{array}{r} 20 \\ \times\ 7.6 \\ \hline 120 \\ 1400 \\ \hline 152.0 \end{array} \rightarrow 152.0\ in^3$$

NOW DIVIDE EACH BOX Volume into LARGE VOLUME

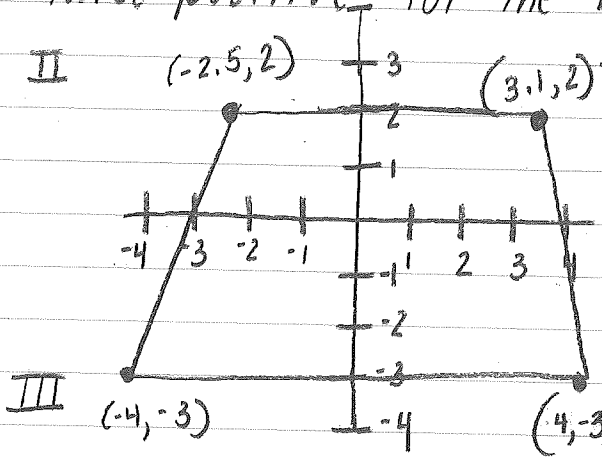
(1) $112 \overline{)592.704} = 5.292 = 5$ boxes

(2) $152 \overline{)592.704} = 3.899 = 3$ boxes

6th Unit 4

Finding the Area of 2-D shapes on a Graph

1. Label Quadrants and axis (x & y)
2. Plot all coordinates
   - RECHECK because if your coordinates are incorrect, your area will be wrong!
3. If your shape crosses either axis, you will find the false positive for the base or the height.



This will have a false positive for base, & base$_2$ because it crosses the y axis.

So find base, = (-2.5) → | — (3.1) Use only the x coordinate

0

2.5 + 3.1 = 5.6 = base,

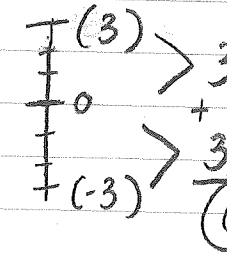
So find base$_2$ = (-4) → | → (+4)

0

4 4 = 8 = base$_2$

Find height by using 1 or 2 below:

1. Find the height $y_2 - y_1$ = height $-3 - 3 = -3 + -3 = -6$ or 6
   OR
2. - you will have a false positive because it crosses the x axis



OR USE

THEN FIND AREA!

$h\left(\frac{b_1 + b_2}{2}\right) \rightarrow 6\left(\frac{5.6 + 8}{2}\right) = \left(\frac{13.6}{2}\right)6$

$(6.8)6 \rightarrow$ 34 units^2

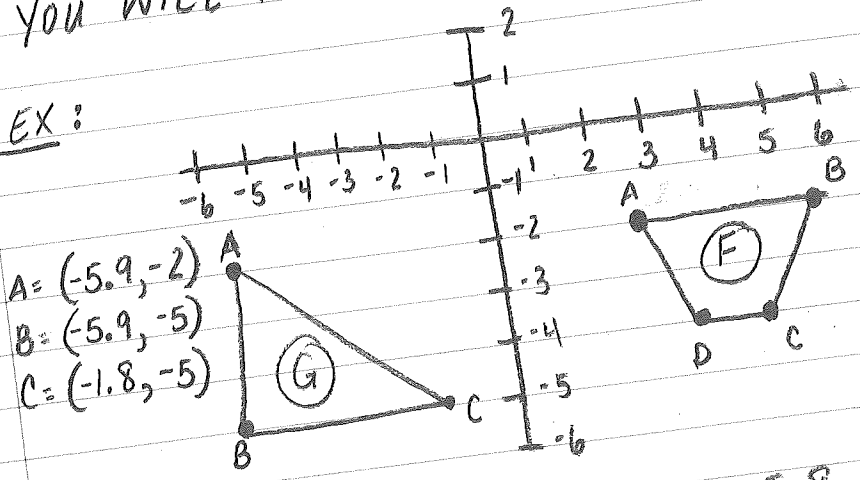
(2)

6th Unit 4

Finding the area of 2-D shapes on a Graph

* If your shape does not CROSS the x or y axis, you WILL NOT USE A FALSE POSITIVE!

EX:



Find the area:

(F) $2.6 \rightarrow 5.8 = 5.8 - 2.6 \rightarrow \begin{array}{r} 5.8 \\ -2.6 \\ \hline 3.2 \end{array}$ = base,

Base,

$3.1 \rightarrow 4.9 = 4.9 - 3.1 \rightarrow \begin{array}{r} 4.9 \\ -3.1 \\ \hline 1.8 \end{array}$ = base$_2$

Base$_2$

FORMULA

$h\left(\frac{b_1 + b_2}{2}\right)$

$2\left(\frac{3.2 + 1.8}{2}\right)$

$2\left(\frac{5}{2}\right) =$

$2 \cdot 2.5 =$

5

Height = $y_2 - y_1 = -4 - (-2)$ Follow the RULES of Integers

$-4 + (+2) = -2 \rightarrow +2 \rightarrow$ height

✓ because you aren't going backwards

5 units^2

(G) $\frac{b \cdot h}{2}$ = Triangle are

base$_1$ = $-5.9 \rightarrow -1.8 \rightarrow 5.9 - 1.8 = \begin{array}{r} 5.9 \\ -1.8 \\ \hline 4.1 \end{array}$ = base,

height = -5 to $-2 = 3$ units $\rightarrow \frac{4.1 \times 3}{2} = \frac{12.3}{2} =$ (