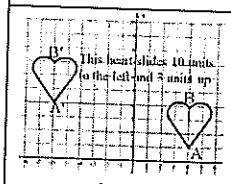
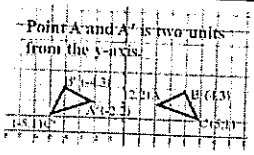
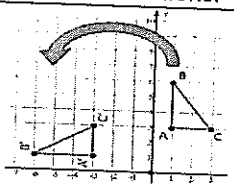
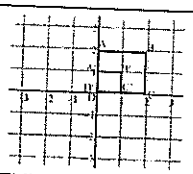
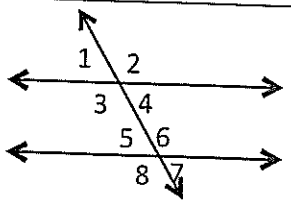
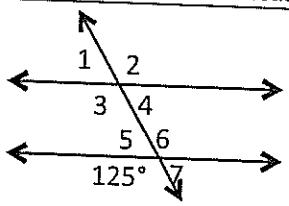
8th Grade GMAS Review Cheat Sheet

Unit 1: Transformations, Congruence, and Similarity

Transformations...

Translation - "slides" each point of a figure the same distance in the same direction without changing its size or shape and without turning it or flipping it.	**Reflection** - "flips" a figure over a mirror or reflection line; An object and its reflection have the same shape and size, but the figures face in opposite directions.	**Rotation** - turns a figure about a fixed point at a given angle and a given direction; An object and its rotation are the same shape and size, but the figures may be turned in different directions.	**Dilation** – proportionally changes the size of an object (by shrinking or stretching), but not the shape
 SLIDE	 FLIP	 TURN	 ENLARGE/REDUCE To dilate points (x, y) multiply x and y by the scale factor

Angles...

Relationships		Measurements	
	**Alternate Interior** 3 & 6 **Alternate Exterior** 2 & 8 **Consecutive Interior** 4 & 6 **Corresponding** 1 & 5 **Vertical** 2 & 3 **Adjacent** 7 & 8		m**1** =55° m**2** = 125° m**3** = 125° m**4** = 55° m**5** = 55° m**6** = 125° m**7** = 55°

Unit 2: Exponents

Estimating Radicals:	Scientific Notation:	Multiplying:	Dividing:
1) Draw a number line 2) Find the closest perfect squares – one smaller and one larger 3) Eliminate answer choices	3,420,000 = **3.2 x 10^6** .00000000986 = **9.86 x 10^9** 1. Place decimal behind first non 0 number 2. Multiply by 10 3. Count spaces new to old (exponent) Left = negative and right = positive	(2.3×10^5) (1.4×10^2) 1) 2.3 x 1.4 = **3.22** 2) $10^5 \times 10^2 = 10^7$ 3) **3.22 x 10^7**	(6×10^8) ÷ (2×10^2) 1) 6 ÷ 2 = **3** 2) $10^8 \div 10^2 = 10^6$ 3) **3 x 10^6**

Exponent Rules – must have the same base!! Keep the base!!

Multiplying:	Dividing:	Power to a Power:	Negatives:
add exponents $4^2 \times 4^6 = 4^8$	subtract exponents $6^7 \div 6^4 = 6^3$	multiply exponents $(3^5)^2 = 3^{10}$	flip to become positive $2^{-6} = \frac{1}{2^6}$

Pythagorean Theorem:
only works with right Δ's
$a^2 + b^2 = c^2$
a & b are legs
c is hypotenuse, longest side, opposite right angle

You are creating a picture frame in the shape of a right triangle. You have calculated the longest side to be 15 inches. What would be the length of the other two sides?

$a^2 + b^2 = 15^2$
$a^2 + b^2 = 225$
$9^2 + 12^2 = 225$
$81 + 144 = 225$

The other two sides are 9 in. and 12 in.

Is it a Right Triangle?
Plug into $a^2 + b^2 = c^2$ (c is biggest #)

4, 6, 8	**3, 4, 5**
$4^2 + 6^2 = 8^2$	$3^2 + 4^2 = 5^2$
16 + 36 = 64	9 + 16 = 25
52 ≠ 64	25 = 25
NO	**YES**

Unit 3: Geometric Applications of Exponents

Volume of a Cylinder:
$V = Bh$ (B = area of base)
$V = \pi r^2 h$

A Coke can is 5 inches tall and has a radius of 2 inches. What is the volume of the can?

L: r = 2 h = 5
W: $V = \pi r^2 h$
P: $V = (3.14)(2^2)(5)$
C: $V = 62.8\ in^3$

Volume of a Cone:
V = V =

What is the volume of an ice cream cone with a radius of 3 and height of 4?

L: r = 3 h = 4
W: V =
P: V =
C: V = 37.7

Volume of a Sphere:
V =

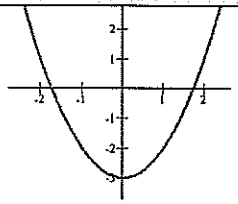
You are playing softball with friends. The ball has a diameter of 10 cm. What is the volume of the softball?

L: d = 10 r = 5
W: V =
P: V =
C: $V = 523.3\ cm^3$

Label the information
Write the formula
Plug in the information
Chug out the answer

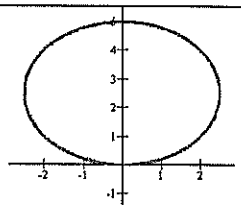
Unit 4: Functions

Function –
one output for every input (x values can't repeat, pass vertical line test)



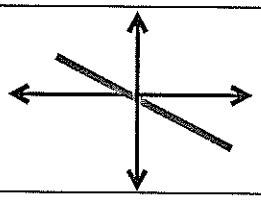
x	y
2	8
3	9
5	10
4	11

Not a Function –
Doesn't pass vertical line test, x values repeat...



x	y
1	3
2	2
2	10
3	4

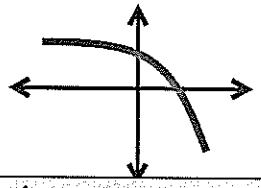
Linear –
Have to have a common difference, have the slope intercept form (y=mx+b), and form a straight line when graphed.



y = 2x + 1

y = -9x – 4

Nonlinear –
Are a curved or broken line when graphed; in the equation there are exponents, variables multiplied together, or variables in the denominator.



$y = x^3$

$8 = 6xy$

$3 =$

Unit 5: Linear Functions

To find an equation, you always need a slope (m) and y-intercept (b)!!!!!

Equation From a Graph
1. Find the y-intercept (b)
2. Locate another point
3. From the "b" use rise over run to get to the next point – this is your slope (m)
4. Put "m" and "b" into y = mx + b

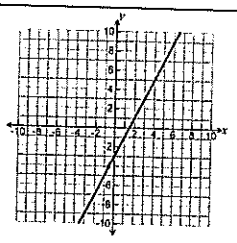
Equation From a Table
1. Find = m
2. Pick a point (x,y) and plug into y=mx+b along with m
3. Solve for "b"
4. Put "m" and "b" into y = mx + b

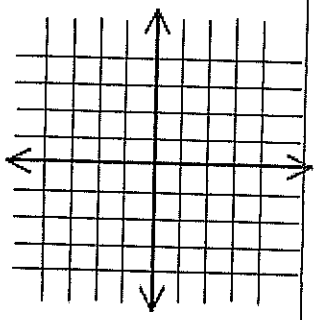
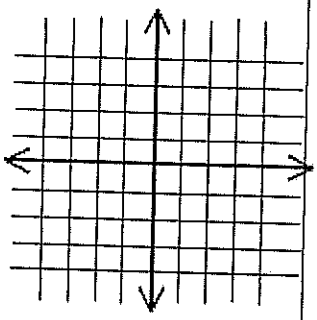
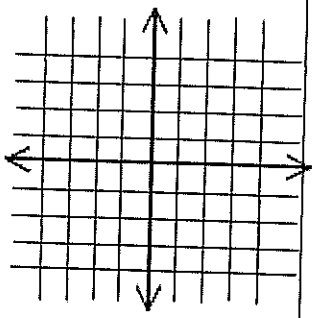
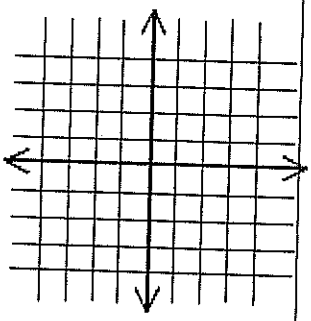
x	y
-1	-2
0	2
1	6

Equation From (x_1,y_1) (x_2,y_2)
1. Find = m
2. Pick a point (x,y) and plug into y=mx+b along with m
3. Solve for "b"
4. Put "m" and "b" into y = mx + b

Determine equation from points (0, -4) and (0, 5).

Word Problem
The distance traveled on a trip is directly proportional to the speed of the car. A car traveled 300 miles in six hours. Write an equation to represent *y*, the distance the car would travel in *x* hours.

Types of SLOPE			
POSITIVE SLOPE	**NEGATIVE SLOPE**	**UNDEFINED SLOPE**	**ZERO SLOPE**
Graphed line moves **upward** from left to right.	Graphed line moves **downward** from left to right.	Graphed line is a **vertical line** (straight up and down).	Graphed line is a **horizontal line**.
			
y = 6x + 1 y = −4	y = -3x + 2 y = x - 1	x = 4 x = -6 x = 3	y = 5 y = -2 y = 8

Unit 6: Linear Models & Tables

Rate of Change

Increasing – positive slope	Decreasing – negative slope	Greatest ROC= Ignore the sign (doesn't matter if positive or negative) and choose biggest number	Least ROC = Ignore the sign (doesn't matter if positive or negative) and choose smallest number

Stories from Graphs

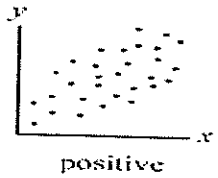
Going away from = distance increasing = positive slope	Going towards = distance decreasing = negative slope	Running = steeper line	Walking = less steep line

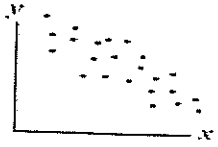
Line of Best Fit

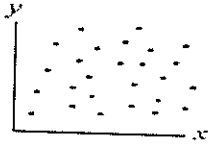
1. Put your ruler in the middle of as many points as possible	2. Draw a straight line across whole graph	3. Find your "b" - Look at where the line crosses the y-axis	4. Find your slope = pick two points and count rise over run.

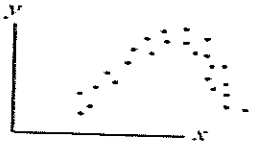
Scatter Plots

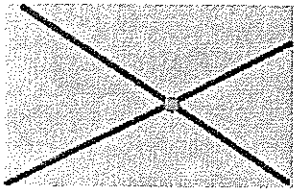
Positive Correlation	Negative Correlation	No Correlation	Strong – close together Weak – far apart


positive


negative


no correlation


non linear

Unit 7: Systems of Equations			
Solution: (x,y) Where the lines intersect	**One Solution:** This is the most common situation and it involves **lines that intersect** exactly 1 time. 	**No Solution:** This only happens when the **lines are parallel.** As you can see, parallel lines are not going to ever meet. Example of a stem that has no solution: Line 1: y = 5x +13 Line 2: y = 5x + 12 	**Infinitely Many Solutions:** This is the rarest case and only occurs when you have the **same line** Consider, for instance, the two lines below (y = 2x+1 and 2y = 4x +2). These two equations are really the same line. Example of a system that has infinite solutions: Line 1: y = 2x + 1 Line 2: 2y = 4x + 2