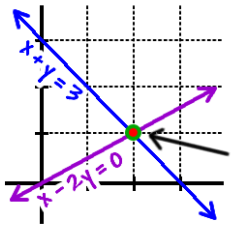
Air Review(Day 2)

Name:_____

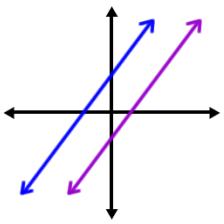
PART A: Systems of Equations

Graphing:

one solution



No solution



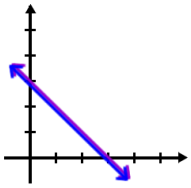
Infinite Solutions

What do they have in common?

The same slope!

$x + y = 3$

$2x - 2y = -6$



These are the same line, so there are an infinite number of solutions.

Substitution:

$3x - 7y = -14$

$x = 2y - 3$

Notice that one equation is solved for X...

Let's stick that X blob into the other equation in place of X:

$3x - 7y = -14$

$x = (2y - 3)$

This gives us

$3(2y - 3) - 7y = -14$ Solve for y

$6y - 9 - 7y = -14$

$-y - 9 = -14$

$+9 \quad +9$

$-y = -5$

$y = 5$

OK, we've got y... Now, we need X... See the circled blob above?

Stick it in there! (That's why I circled it!)

$x = (2y - 3)$

$y = 5$

$x = 2(5) - 3 = 7$

$x = 7$

Is our answer (7, 5)

Elimination:

$2x + 3y = 20$

$-2x + y = 4$

See how these guys are the same, but with a different sign?

Just add "like terms" and drag the "=" down to:

$2x + 3y = 20$

$+ \quad -2x + y = 4$

$0 + 4y = 24$

$4y = 24$

$y = 6$

We've got one of them... Now, we just need to get the X. To do this, you can stick the y into either of the original equations...

The second equation is easier:

$y = 6$

$-2x + y = 4$

$-2x + 6 = 4$

$-2x = -2$

$x = 1$

It looks like the answer is (1, 6).

Stephanie adds pennies, nickels and quarters to a scale until the mass of the combined coins is 75 grams. Each penny has a mass of 2.5 grams, each nickel has a mass of 5 grams and each quarter has a mass of 5.7 grams.

Create an equation to model this situation, where x is the number of pennies, y is the number of nickels and z is the number of quarters that Stephanie can put on the scale so that the mass of the combined coins is exactly 75 grams.

$2.5P + 5N + 5.7Q = 75$

$2.5x + 5y + 5.7z = 75$

What two numbers have a sum of 217 and a difference of 85?

151

66

$$\begin{array}{r} x+y=217 \\ +\ x-y=85 \\ \hline 2x=302 \\ x=151 \end{array} \qquad \begin{array}{r} 151+y=217 \\ -151 \quad -151 \\ \hline y=66 \end{array}$$

Jacob is 3 years older than Sarah, and Caroline is twice as old as Sarah. If Caroline is 28 years old, how many years old is Jacob?

$J = S + 3$

$C = 2S$

$\frac{28}{2} = \frac{2S}{2}$

$S = 14$

$J = 14 + 3$

$J = 17$

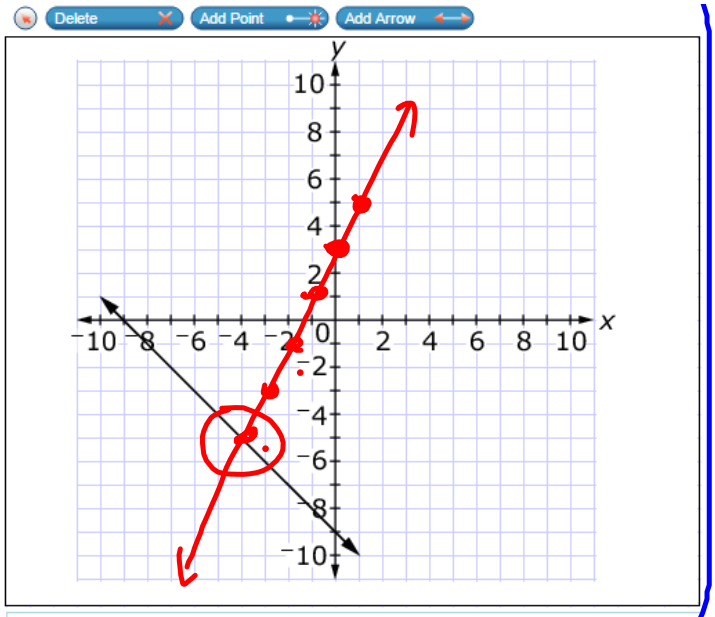
The graph of $x + y = -9$ is shown.

Use the Add Arrow tool to graph the equation $y = 2x + 3$ on the same coordinate plane. Use the Add Point tool to plot the solution to this system of linear equations.

$y = 2x + 3$

$m = 2$

$b = 3$



$(-4, -5)$

How many solutions does the linear system $-8x + 2y = 6$ and $-4x + y = 3$ have?

(A) 0 (B) 1 (C) 2

(D) 3 (E) Infinitely many

$-8x+2y=6$

$(-2)\ -4x+y=3$

$-8x+2y=6$

$8x-2y=-6$

$0=0$ true

A theater sells tickets for a concert. Tickets for lower-level seats sell for $35 each, and tickets for upper-level seats sell for $25 each. The theater sells 350 tickets for $10,250.

How many tickets of each type were sold?

Lower level tickets: 150

Upper level tickets: 200

x = lower level $35

y = upper $25

$x + y = 350$ $x = 350 - y$

$35x + 25y = 10250$

$35(350 - y) + 25y = 10250$

$12250 - 35y + 25y = 10250$

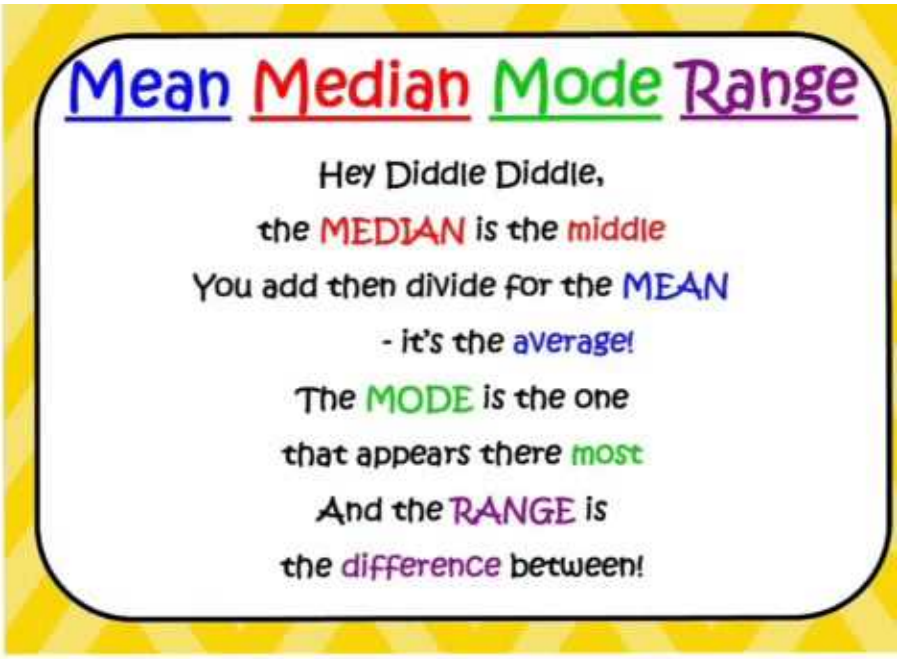
$12250 - 10y = 10250$

$-12250 \quad -12250$

$\frac{-10y}{-10} = \frac{-2000}{-10}$

$x = 150 \quad y = 200$

PART B: Data and Probability



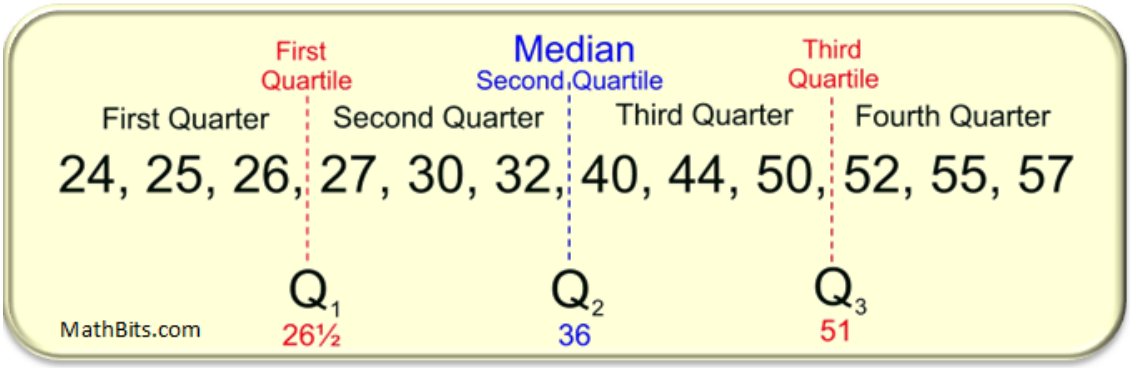
Desmos!

mode()

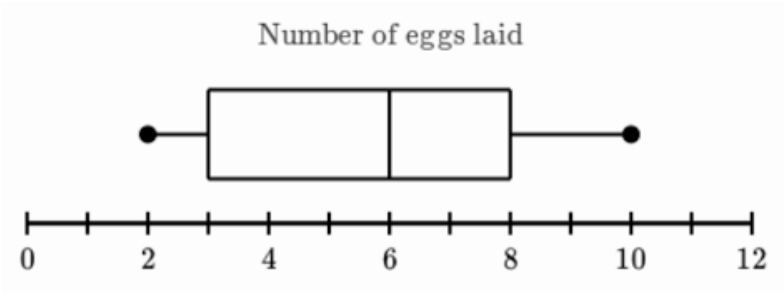
median()

mean()

stdev()

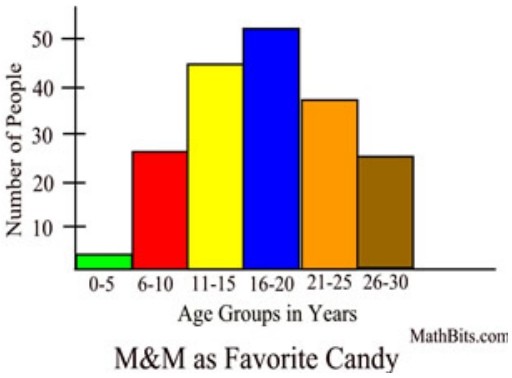


Inner Quartile Range: Q3 - Q1



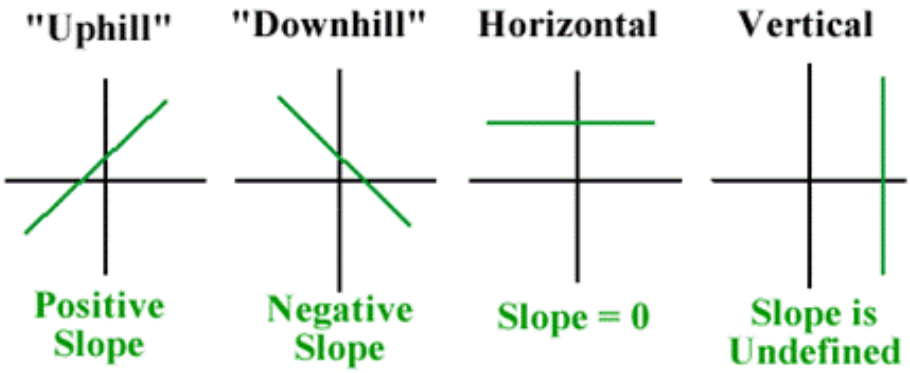
Stem	Leaf
1	0 3 6
2	1 6 7 8
3	5 5 6
4	1 1 5 6 9
5	0 3 6 8

1 | 0 = 10%



Class interval	Tally	Frequency
0 - 39	I	1
40 - 79	𝍸	5
80 - 119	𝍸 𝍸 II	12
120 - 159	𝍸 III	8
160 - 199	IIII	4
200 - 239	I	1
	Sum =	31

Slope:



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Mrs. Harp grew pumpkins with these weights (in pounds) last year. Find the mean, median, mode, range, standard deviation, and Q1 and Q3.

985-12

range 973

12, 13, 13, 50, 75, 85, 985

Q1 median Q3

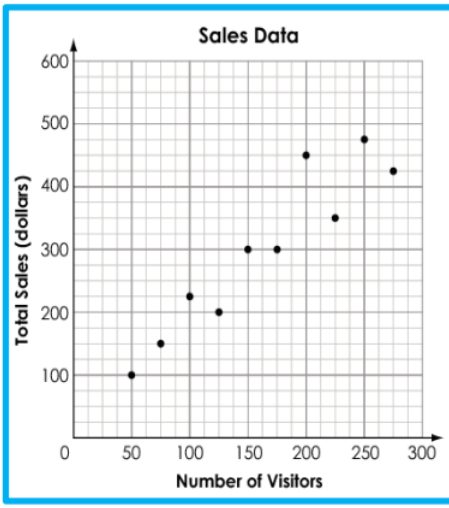
IQR = 85-13 72

Probability:

$$\frac{\text{\# of occurences}}{\text{total \#}}$$

What is the probability of randomly picking a pumpkin off that Mrs. Harp grew that weighed 13 lbs?

12, 13, 13, 50, 75, 85, 985



A store manager records the total visitors and sales, in dollars, for 10 days. The data are shown in the scatter plot.

What conclusion can the store manager draw based on the data?

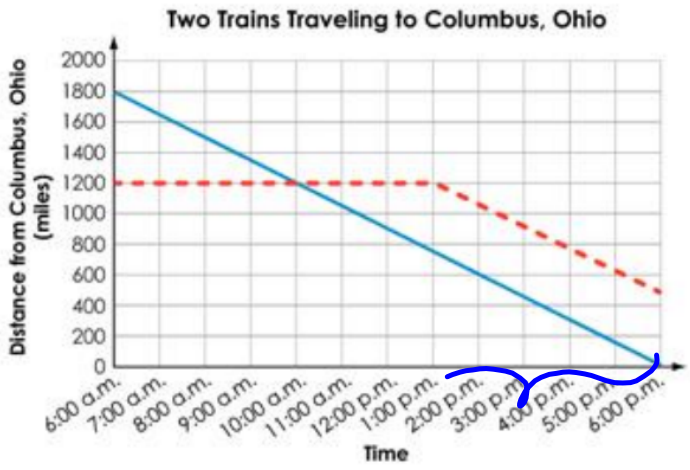
(A) An increase in sales causes a decrease in visitors.

(B) An increase in visitors causes an increase in sales.

(C) An increase in sales is correlated with a decrease in visitors.

(D) An increase in visitors is correlated with an increase in sales.

Two freight trains are traveling to Columbus, Ohio. A graph is shown representing each train's remaining distance to Columbus over time.



$\frac{\Delta y \text{ mi}}{\Delta x \text{ hr}}$

A. Compare the distances relative to Columbus from which the trains begin their trip.

B. Tom claims both trains traveled at the same speed over a certain interval. Sara claims that both trains traveled at different speeds the entire time. Justify which claim is correct.

Type your answer in the space provided.

Mrs. Jones surveys her class about their siblings. In the class, 75% of the students have a brother, 82% have a sister, and 65% have both a brother and a sister.

What is the probability that a student has a brother or a sister?

1	2	3
4	5	6
7	8	9
0	.	-

Which statistical measure changes when every number in a data set is increased by 10?

(A) range

(B) mean

(C) standard deviation

(D) interquartile range