

Review Sheet-Algebra I – Virginia SOL

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}}$$

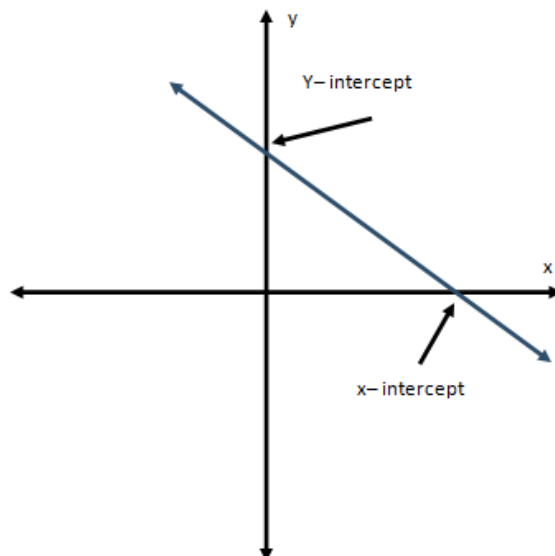
$$(x_1, y_1) (x_2, y_2)$$

$$\text{Slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + b$$

$$m = \text{slope}$$

$$b = y \text{ intercept}$$



When dividing exponents, subtract powers:

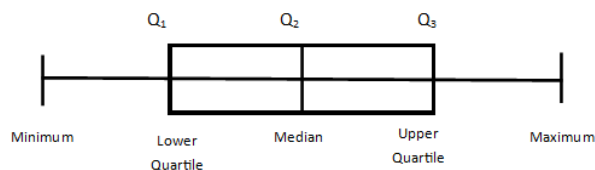
$$\frac{x^7 y^2}{x^3 y^5} = x^{7-3} (y^{2-5}) = x^4 y^{-3} = \frac{x^4}{y^3}$$

When multiplying exponents, add powers:

$$x^3 x^4 = x^{3+4}$$

To get y-intercept set $x=0$, in the equation

To get x-intercept set $y=0$, in the equation



Solving System of Equations

What is the solution to the system of equations?

$$\begin{cases} 2x + 3y = 21 \\ 7x - 5y = -4 \end{cases}$$

- a) (3,2)
- b) (3,7)
- c) (4,5)
- d) (3,5)

(x, y)

1. Plug in each ordered pair into the equations
2. The ordered pair that satisfies both equations is the answer

Domain	Range
x	y

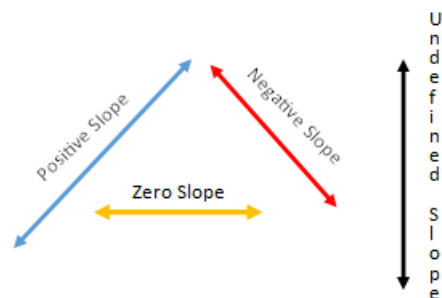
Direct Variation goes through the origin

X	Y
1	3
2	6
3	9

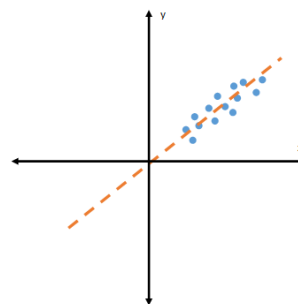
$(0,0)$

$$\text{Range} = \text{Max} - \text{Min}$$

$$\text{Interquartile Range} = \text{Upper Quartile} - \text{Lower Quartile}$$



Line of Best Fit



Calculator Strategies:

Example:

Which of the following polynomial is equivalent to this expression if $n \neq -1$?

$$\frac{3 + n - 2n^2}{1 + n}$$

1. Chose a number to substitute for "n" (not -1)
In this example, let $n=4$:
2. Set $n=4$
Calculator: Press "Sto>" "Alpha" "Log" (n)
3. Type the expression into calculator and press "Enter"
4. Record answer
5. Type each answer choice as it is written
6. The answer choice that produces same number is the correct answer

Example:

Solve for x :

$$\begin{array}{r} 3x - 20 = -2x \\ y_1 = \quad y_2 = \end{array}$$

1. Plug the left-hand side into $y_1 =$ and the right-hand side into $y_2 =$
2. Press 2nd, trace(Calc), and then press enter 3 times
If you get an error you will need to expand your window, do this by pressing "zoom", and then "zoom out"

Table Problems/ Line of Best Fit

First Step:

"Stat">> "Edit">>Enter Values

Second Step:

"Stat">> "Calc">> (4) LinReg">>Scroll down to Calculate

If that answer isn't given...

Third Step:

"Stat">> "Calc">> (5) QuadReg">>Scroll down to Calculate

$\sqrt{\quad}$ Not simplified if contains powers greater than x, y ($x^2, x^3, y^2, y^3 \dots$)

$\sqrt[3]{\quad}$ Not simplified if contains powers greater than x^2, y^2 ($x^3, y^3, y^4, x^4 \dots$)

*If there are numbers under the $\sqrt{\quad}$ divide them by the perfect squares (4,9,16,25,36,49) ...

*If there are numbers under the $\sqrt[3]{\quad}$ divide them by the perfect cubes (8,27, 64, 125) ...

$$\begin{array}{r} 5 \geq -3x + 2 \\ 3 \geq -3x \\ \underline{-3} \geq \underline{-3} \\ -1 \leq x \end{array}$$

When you divide or multiply by a negative $< or \leq$ become $> or \geq$ and vice versa

Factoring/ Finding Zeros (hard, but big points on SOL)

$$x^2 - 2x - 8$$

Using calculator:

1. Press "APPS"
2. Scroll to find "PlySmlt2"
3. Press any button
4. Select "1: Poly Root Finder"
5. Press "graph" to select "NEXT"
6. Enter a_2, a_1, a_0 ($a_2 = 1, a_1 = -2, a_0 = -8$)
7. Press "GRAPH" to select "SOLVE"

If you are finding zeros, you have your answers

If you are factoring, you have a one more step

1. Plug in zeros (x_1, x_2) into your answer choices

Going from Points to Equation of Line

1. Find slope:

$$\text{Slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

2. Now have everything to fill in this equation:

$$(y - y_1) = m(x - x_1)$$

3. Solve for y=

Example:

$$(1, -2) (3, 5)$$

Finding Slope:

$$\frac{5 - (-2)}{3 - 1} = \frac{5 + 2}{2} = \frac{7}{2}$$

Filling in Equation:

$$(y - (-2)) = \left(\frac{7}{2}\right)(x - 1)$$

$$y + 2 = \left(\frac{7}{2}\right)x - \left(\frac{7}{2}\right)$$

$$y = \left(\frac{7}{2}\right)x - \frac{7}{2} - 2$$

$$y = \left(\frac{7}{2}\right)x - \frac{7}{2} - \frac{4}{2}$$

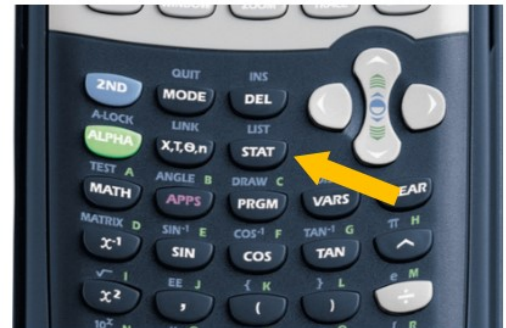
$$y = \left(\frac{7}{2}\right)x - \frac{11}{2}$$

$$z - \text{score} = \frac{x - \text{mean}}{\text{Standard Deviation}}$$

Negative z-scores are less than the mean

Positive z-scores are greater than the mean

A z-score of -0.5 is closer to the average than 1.5



Solution to a system of equation is the (x, y) point where lines cross

