

Test A

Quality – Accuracy – Transfer – 100%

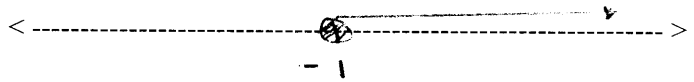
Section 1. Inequalities

Graph the inequalities on the number lines provided. Perform a “point test” to prove that the direction of your solution set from the endpoint is correct.

1. $-5 \leq 3y - 2$
 $+2 \quad +2$

$$\frac{-3 \leq 3y}{3 \quad 3}$$

$$-1 \leq y \quad \text{or} \quad y \geq -1$$



At -2
 $-5 \leq 3(-2) - 1$
 $-5 \leq -6 - 1$
 $-5 \leq -7$

At 0
 $-5 \leq 3(0) - 1$
 $-5 \leq 0 - 1$
 $-5 \leq -1$

No

Yes

Section 2. Formulas and Literal Equations.

Re-Arrange the following formulas and literal equations to solve for the “asked for” variable.

3. $S = \frac{A - B}{A}$, for B

By Proportion: $\frac{S}{1} = \frac{A - B}{A}$

$$SA = A - B$$

$$-A \quad -A$$

$$SA - A = -B$$

$$-SA + A = B$$

4. $C = a + bx$ for x.
 $-a \quad -a$

$$\frac{C - a}{b} = \frac{bx}{x}$$

$$x = \frac{C - a}{b}$$

Section 3. Word Problems.

5. A company plans to issue 24,500 shares of two different kinds of stock which will have a combined value of \$800,000. One stock is worth \$100 per share and the other is \$25 per share. How many shares of each stock will be issued?

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |

2500 shares of \$100 stock

22000 shares of \$25 stock

Let x = 100 Shares

$(24,500 - x) = 25$ Shares

$$100x + 25(24500 - x) = 800,000$$

$$100x + 612500 - 25x = 800,000$$

$$75x + 612500 = 800,000$$

$$-612500 \quad -612500$$

$$75x = 187500$$

$$x = 2500$$

7. An airplane made a flight of 1600 miles in 5 hours. In the first 3 hours, it had good weather. It ran in to bad weather which decreased its rate of speed by 75 mph for the rest of the flight. Find the rate of the plane on each part of the trip.

| Trip | Rate | Time | Distance |
|------|----------|------|-------------|
| Good | x | 3 | $3x$ |
| Bad | $x - 75$ | 2 | $2(x - 75)$ |

$$3x + 2(x - 75) = 1600$$

$$3x + 2x - 150 = 1600$$

$$5x - 150 = 1600$$

$$+150 \quad +150$$

$$5x = 1750$$

$$x = 350$$

Good Weather = 350 mph

Bad Weather = 275 mph

8. A technician had a solution that was 24% sodium citrate and another solution that was 18% sodium citrate. How many liters of both must he mix to produce 90 liters of a 22% sodium citrate mix?

| Solution | Amount | % age | Total |
|----------|------------|-------|---------------|
| 24% | x | .24 | $.24x$ |
| 18% | $(90 - x)$ | .18 | $.18(90 - x)$ |
| 22% | 90 | .22 | $.22(90)$ |

$$.24x + .18(90 - x) = .22(90)$$

$$.24x + 16.2 - .18x = 19.8$$

$$.06x + 16.2 = 19.8$$

$$-16.2 \quad -16.2$$

$$.06x = 3.6$$

$$x = 60$$

60 L of 24% Solution

30 L of 18% Solution

Section 4. Variation.

9. A truck can travel 245 miles on 35.0 gal of diesel fuel. At this rate, how much diesel fuel would be required to go 1250 miles?

$$\frac{\text{Miles}}{\text{Gal}} = \frac{245}{35.0} = \frac{1250}{x}$$

$$245x = 43750$$

$$\frac{245x}{245} = \frac{43750}{245}$$

$$x = 178.6 \text{ gals} = 177 \text{ g (3 sig figs)}$$

10. q is inversely proportional to the square root of p , and $q = 5$ when $p = 9$. Find the constant (k) of variation.

Solve by Proportion

$$q = \frac{k}{\sqrt{p}}$$

$$5 = \frac{k}{\sqrt{9}}$$

$$\frac{5}{1} = \frac{k}{3}$$

$$k = 15$$

11. Find y when $x = 5$ if y varies directly as x and $y = 36$ when $x = 2$.

$$\begin{array}{lcl}
 y = kx & 36 = k(2) & y = 18(5) \\
 & 36 = 2k & y = 90 \\
 & 18 = k &
 \end{array}$$

Section 5. Functions

12. Evaluate the Given Function: $f(x) = 3x - 2x^2$; $f(-1)$, $f(-3)$

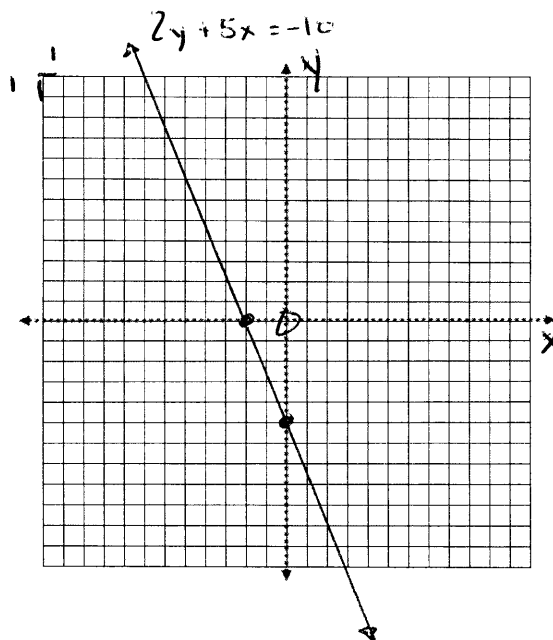
$$\begin{array}{lcl}
 f(-1) = 3(-1) - 2(-1)^2 & f(-3) = 3(-3) - 2(-3)^2 & \\
 = -3 - 2(+1) & = -9 - 2(+9) & \\
 = -3 - 2 & = -9 - 18 & \\
 = -5 & = -27 &
 \end{array}$$

13. $f(p) = p^3 - 2p + 1$; $f(-2)$

$$\begin{array}{l}
 f(-2) = (-2)^3 - 2(-2) + 1 \\
 = -8 + 4 + 1 \\
 = -3
 \end{array}$$

14. Graph by the Intercepts Method:
 $2y + 5x = -10$

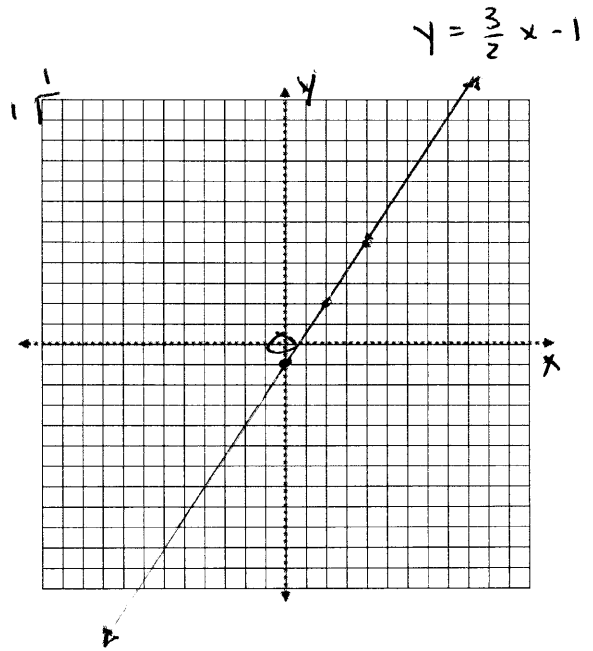
$$\begin{array}{lcl}
 \text{At } x = 0 & \text{At } y = 0 & \\
 2y + 5(\cancel{0}) = -10 & 2(\cancel{y}) + 5x = -10 & \\
 2y = -10 & +5x = -10 & \\
 y = -5 & x = -2 &
 \end{array}$$



15. Graph by Choosing 3 x values and solving for 3 y's.

$$y = \frac{3}{2}x - 1$$

| x | | $y = \frac{3}{2}x - 1$ |
|---|----|---|
| 0 | -1 | $y = \frac{3}{2}(0) - 1$ $y = 0 - 1$ |
| 2 | 2 | $y = \frac{3}{2}(2) - 1$ $y = 3 - 1$ |
| 4 | 5 | $y = 2$ $y = \frac{3}{2}(4) - 1$ $y = 6 - 1$ $y = 5$ |



15. Graph the Linear Equation Using an Accepted Technique. Show All Work.

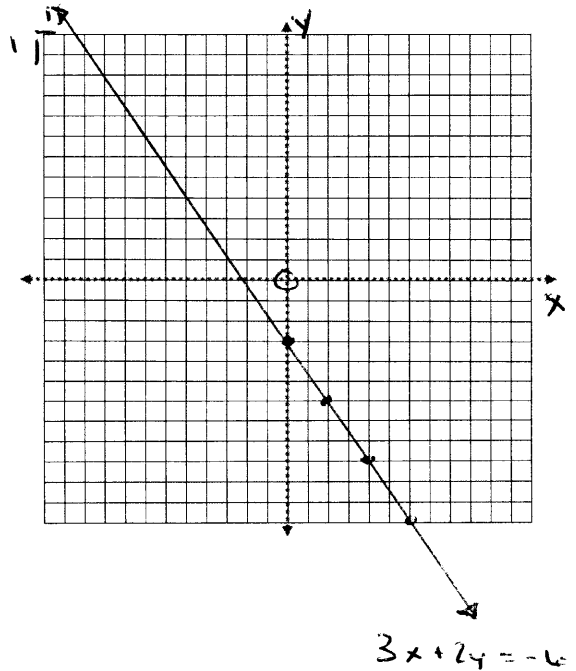
$$3x + 2y = -6$$

$$\frac{2y}{2} = -\frac{3x}{2} - \frac{6}{2}$$

$$y = -\frac{3}{2}x - 3$$

$$m = -\frac{3}{2} = \frac{\Delta y}{\Delta x}$$

$$b = -3$$



Graphing 2nd Degree Equations – Use Technology and/or An Acceptable Technique.

Graph: $y = x^2 + 2x - 3$

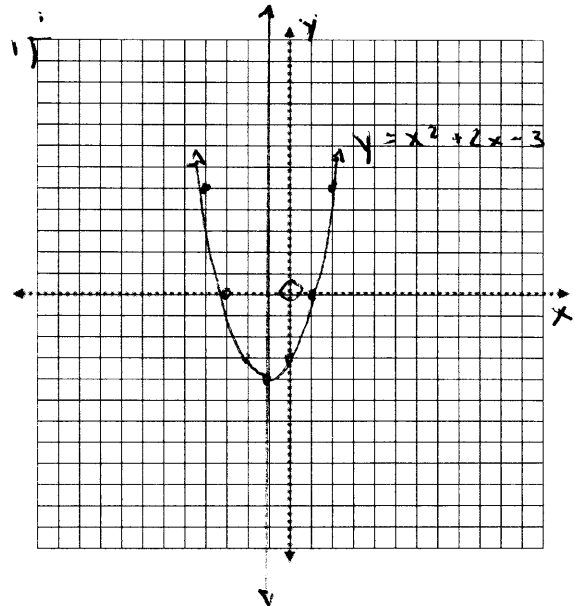
$a = 1$ $b = +2$ $c = -3$

$x = \frac{-b}{2a} = \frac{-2}{2(1)} = -1$

Identify:

The Vertex Point: $(-1, -4)$ Max/Min

Any "Zeros" Evident: $x = -3$, $x = +1$



Work:

| x | y | $y = x^2 + 2x - 3$ |
|----|----|--|
| -4 | 5 | $y = (-4)^2 + 2(-4) - 3$ $= +16 - 8 - 3$ |
| -3 | 0 | $y = (-3)^2 + 2(-3) - 3$ $= +9 - 6 - 3$ |
| -2 | -3 | $y = (-2)^2 + 2(-2) - 3$ $= (-1)^2 + 2(-1) - 3$ |
| -1 | -4 | $= +1 - 2 - 3$ |
| 0 | -3 | $y = (0)^2 + 2(0) - 3$ $0 + 0 - 3$ |
| 1 | 0 | $y = (1)^2 + 2(1) - 3$ $= 1 + 2 - 3$ |
| 2 | 5 | $y = (2)^2 + 2(2) - 3$ $= 4 + 4 - 3$ |