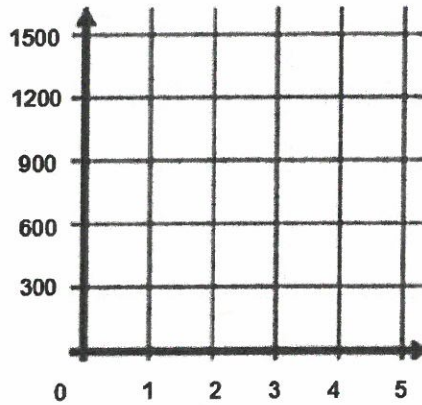1.) An arrow travels at a rate of 300 feet per second and has already traveled 1200 feet. Draw a label a graph.

Independent: Seconds

Dependent: feet
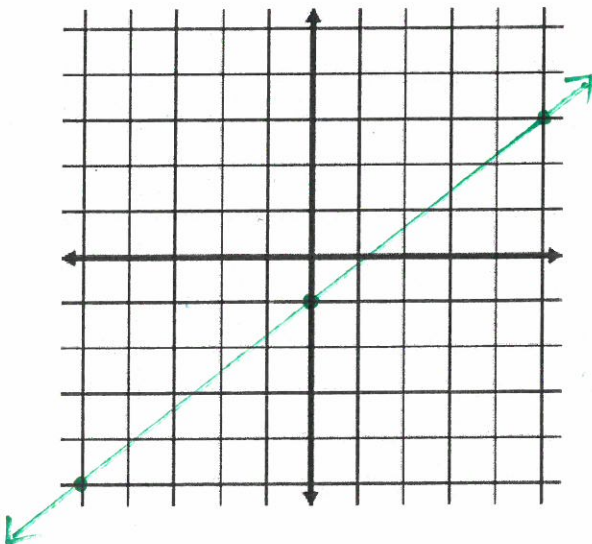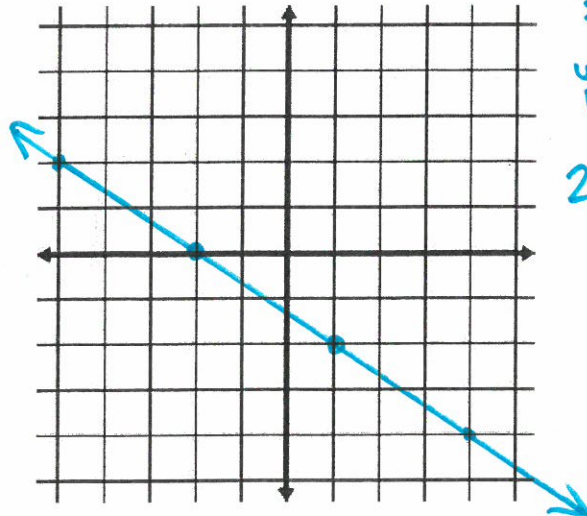
Equation:
$$\underline{y = 300x + 1200}$$

2.) $\frac{1}{5}x - 10 = \frac{-3}{4}x + \frac{1}{2}$

3.) $-3(x + 10) - 14 = \frac{1}{2}(6x + 8)$

4.) Graph $y = \frac{4}{5}x - 1$

5.) Graph $2x + 3y = -4 \quad -2x$
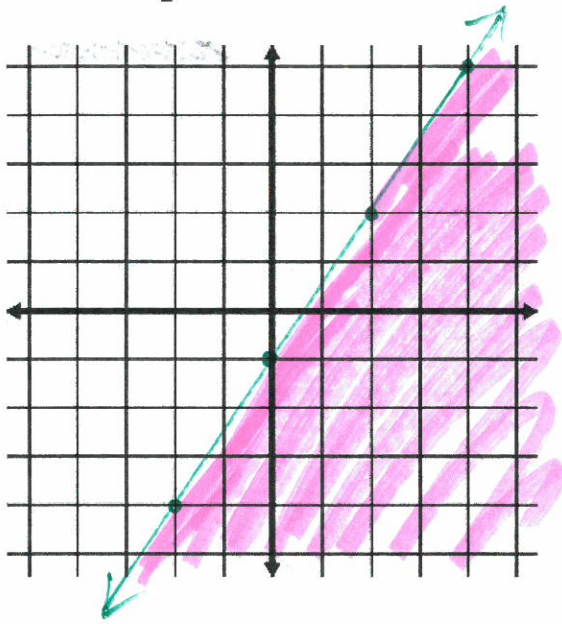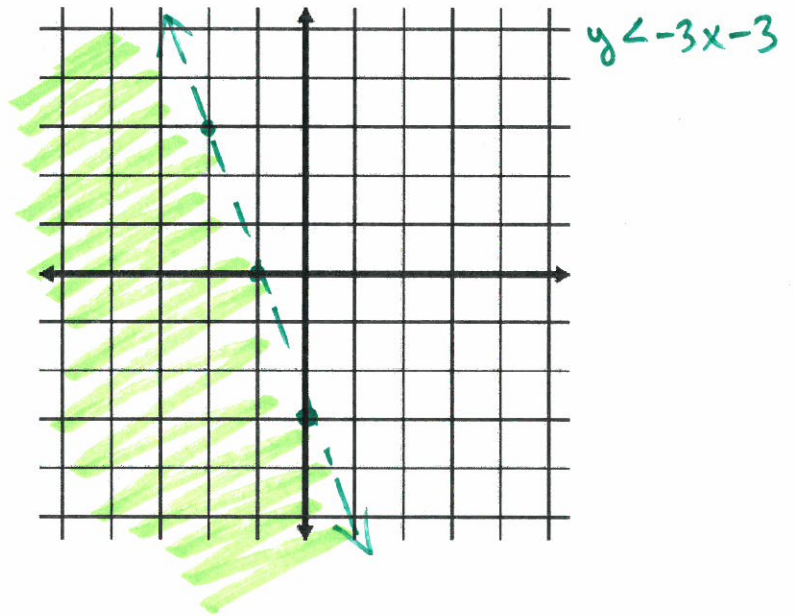$\qquad -2x$

$\frac{3y}{3} = \frac{-2x}{3} - \frac{4}{3}$

$y = -\frac{2}{3}x - \frac{4}{3}$

$2x \boxed{+3y} = -4$

6.) $y \le \frac{3}{2}x - 1$

7.) $-3x - y > 3 \, {}^{+3x}_{+3x}$ $\frac{-y}{-1} > \frac{3x}{-1} + \frac{3}{-1}$

$y < -3x - 3$

Write and solve inequalities.

8.) If the pressure inside a nuclear power plant exceeds 150 psi (pounds per square inch) it could start to leak radioactive gas. If the current pressure is at 25 psi and it begins to rise at a rate of 5 psi per minute, write and solve an inequality that shows the time until meltdown.

$5x + 25 \le 150$
$-25 \quad -25$
$\dfrac{5x}{5} \le \dfrac{125}{5}$ $X \le 25$ min.

Represent inequalities on a number line.

9.) $-5x > 20$
$\dfrac{}{-5} \quad \dfrac{}{-5}$
$X < -4$

10.) $9 > -2m + 2 - 3$

$9 > -2m - 1$
$+1 \qquad +1$
$\dfrac{10}{-2} > \dfrac{-2m}{-2}$
$-5 < m$
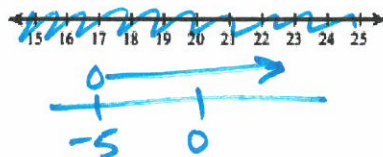
11.) $5(6 + 3r) + 7 \le 127$

$30 + 15r + 7 \le 127$
$15r + 37 \le 127$
$-37 \quad -37$
$\dfrac{15r}{15} \le \dfrac{90}{15}$ $r \le 6$
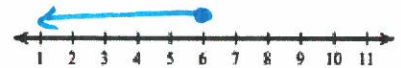
12.) A farmer has a field of 70 acres in which he plants potatoes and corn. The seed for potatoes costs $20/acre, the seed for corn costs $60/acre and the farmer has set aside $3000 to spend on seed. The profit per acre of potatoes is $50 and the profit for corn is $120 an acre.

$x = $ acres of potatoes
$y = $ acres of corn

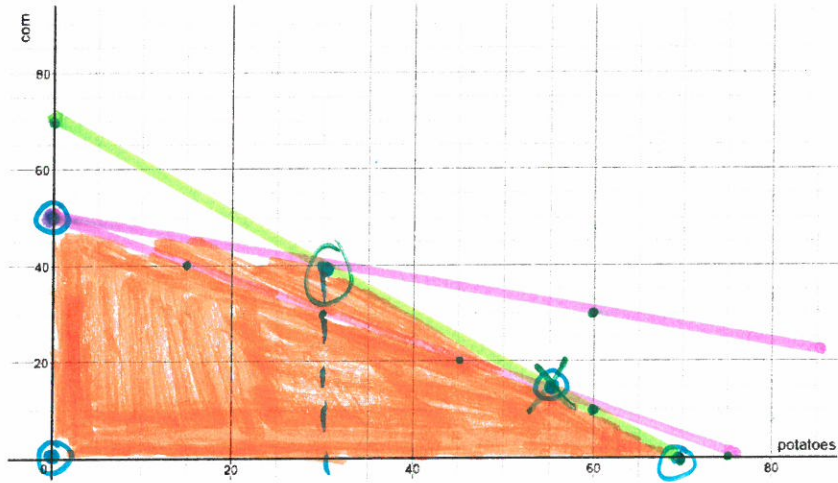|	Potatoes	Corn	Maximum
Profit	$50x$	$120y$	P
Acres	x	y	70
Cost	$20x$	$60y$	3000

$P = 50x + 120y$

$(0, 50) = \$6,000$

$(30, 40) = \$6,300$

$(70, 0) = \$3,500$

$(0, 0) = \$0$

$x + y \le 70 - x$
$-x$

$y \le -x + 70$

$20x + 60y \le 3000$
$-20x \qquad -20x$

$\dfrac{60y}{60} \le \dfrac{-20x}{60} + \dfrac{3000}{60}$

$y \le -\frac{1}{3}x + 50$

$-x + 70 = -\frac{1}{3}x + 50$
$+x \qquad\qquad +x$

$70 = \frac{2}{3}x + 50$
$-50 \qquad -50$

$\dfrac{16}{12} \cdot \dfrac{20}{1} \cdot \dfrac{32}{23} x$

$20 = \frac{2}{3}x$

$30 = x$

Solve and graph compound inequalities.

13.) $-50 < 7k + 6 \le -8$
$\quad -6 \qquad\quad -6 \quad -6$

$\dfrac{-56}{7} < \dfrac{7k}{7} \le \dfrac{-14}{7}$

$-8 < k \le -2$

14.) $7n - 5 \ge 65$ or $-3n - 2 \ge -2$
$\quad\; +5 \quad +5 \qquad\qquad +2 \quad +2$

$\dfrac{7n}{7} \ge \dfrac{70}{7} \qquad \dfrac{-3n}{-3} \ge \dfrac{0}{-3}$
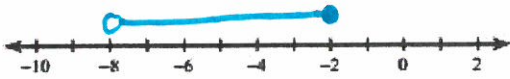
$n \ge 10 \qquad\qquad n \le 0$
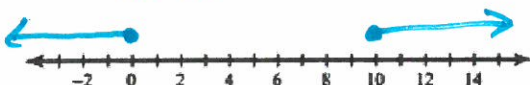
Solve and graph linear absolute value inequalities on a number line.

15.) $|x + 5| < -1$ THINK! (CONJUNCTION) AND

NO SOLUTION

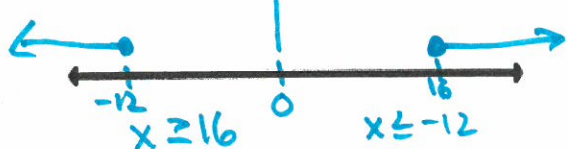**16.)** $|3y - 6| + 1 \ge 43$
$\qquad\qquad -1 \quad -1$

$|3x - 6| \ge 42$ THINK!

$3x - 6 \ge 42 \quad | \quad -(3x - 6) \ge 42$
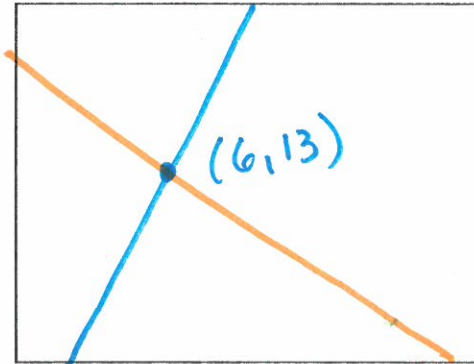
$x \ge 16 \qquad\qquad x \le -12$

Solve the following using DESMOS. Be sure to write to the equations or inequalities you used. Draw a simple picture to the right of the equation of what you see in DESMOS.
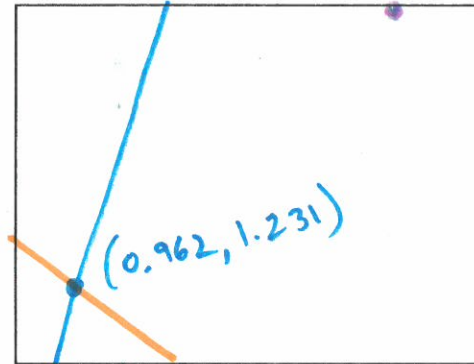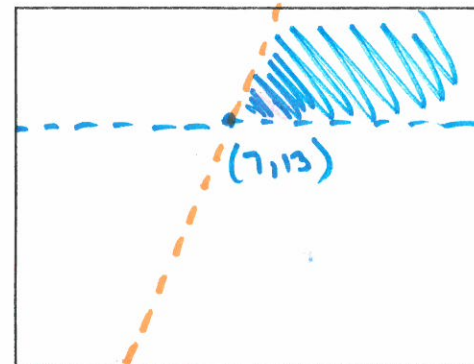
17.) $-\frac{5}{6}x + 18 = 8x - 35$

$\boxed{X = 6}$

$(6, 13)$

18.) $(3x - 3) + 1.4x = -0.4(2x - 5)$

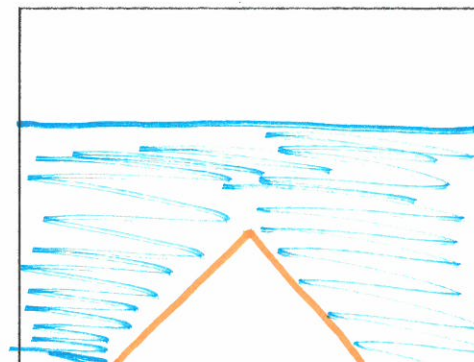$\boxed{X = 0.962}$

$(0.962, 1.231)$

19.) $4x - 15 > 13$

$X > 7$
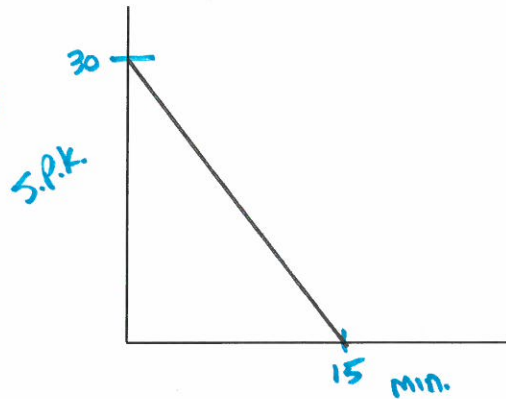

$(7, 13)$

20.) $-|x + 2| - 7 \leq 10$

INFINITE SOLUTIONS

Name _____

Equation and Inequality Review (2)

1.) I have 30 Sour Patch Kids. During the movie I eat 2 every minute.
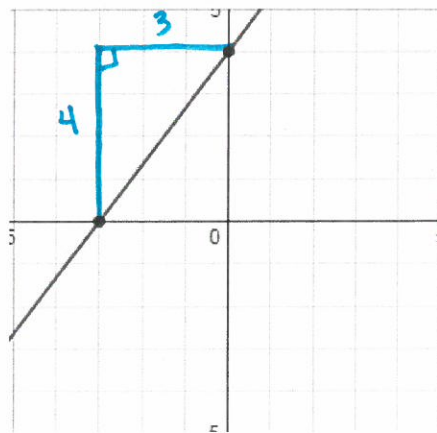
Independent: min.

Dependent: sour patch kids

30

S.P.K

15 min.

2.) Determine unit rate of change from the table. Label your answer.

minutes	feet
0	0
2	→450
4	→900

Unit rate = __225 ft/min.__

3.) Compare tables, equations, and graphs to model and solve linear situations.

X	y
0	4
3	8
6	12
9	16

3

4

Equation:

f(x) = __4/3__ x + __4__

4.) Graph and shade the inequalities.

$y > \dfrac{-2}{3} x + 4$

$-x - y \le -5 + x$

$+x$

$\dfrac{-y}{-1} \le \dfrac{x-5}{-1} = \dfrac{}{-1}$

$y \ge -x + 5$
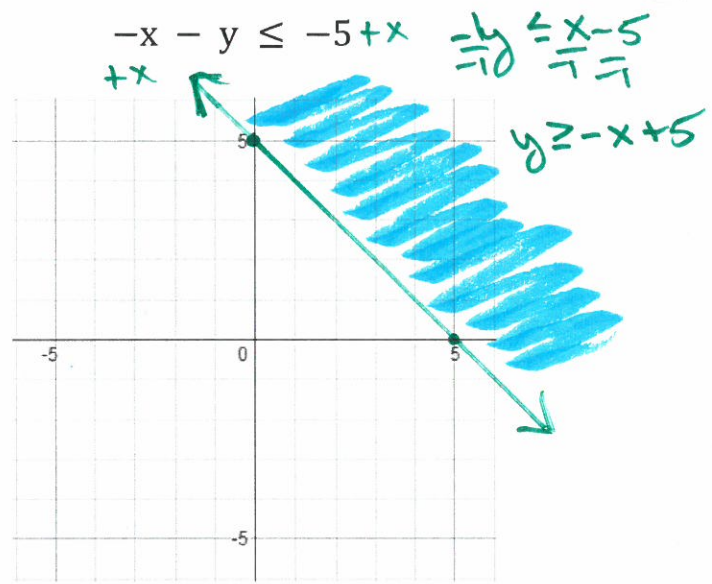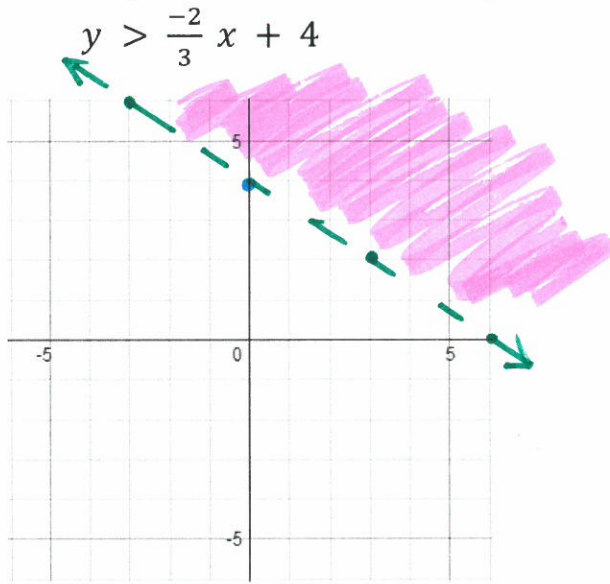
5.) Write and solve inequalities.

A baseball pitcher has a pitch limit of 120 pitches in a game. So far the pitcher has thrown 50 pitches and continues to throw 14 pitches per inning. Write and solve an inequality that shows the number of innings the pitcher can throw for the rest of the game.

$14x + 50 \le 120$
$\quad\;\; -50 \quad\; -50$

$\dfrac{14x}{14} \le \dfrac{70}{14}$

$x \le 5$

6.) Represent inequalities on a number line.

$-x + 5 > 10$
$\;\;\; -5 \quad\;\; -5$

$\dfrac{-x}{-1} > \dfrac{5}{-1}$

$x < -5$

$-4 + 6y \le -112$
$+4 \qquad\qquad +4$

$\dfrac{6y}{6} \le \dfrac{-108}{6}$

$y \le -18$

$-11 \le 6 - 2n - 5$

$-11 \le -2n + 1$
$-1 \qquad\quad -1$

$\dfrac{-12}{-2} \le \dfrac{-2n}{-2}$

$6 \ge n$
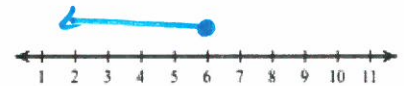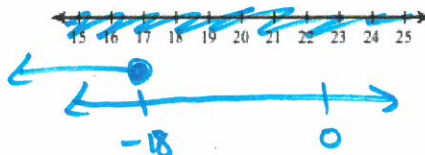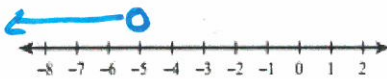
7.) Solve multi-step equations with variables on both sides.

$$-4(x + 3) - 19(2x + 3) = -21x + 57$$

Check: $= -21(-6) + 57$

$-4(-6+3) - 19(2(-6)+3) =$

$12 + 171$

$183 = 126 + 57$

$183 = 183 ✓$

$-4x - 12 - 38x - 57 = -21x + 57$

$-42x - 69 = -21x + 57$

$+ 42x \qquad\qquad +42x$

$-69 = 21x + 57$

$-57 \qquad\quad -57$

$-126 = 21x$

$\overline{21} \quad \overline{21}$

$$\boxed{x = -6}$$

8.) Solve and graph compound inequalities.

$10 < -5k \le 25$

$\overline{-5} \quad \overline{-5} \quad \overline{-5}$

$-2 > k \ge -5$

$7n - 9 \ge 40$ or $-n - 2 \ge -2$

$+9 \qquad +9 \qquad\qquad +2 \qquad +2$
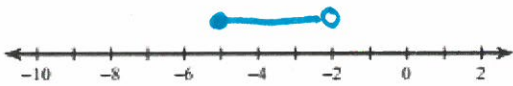
$\dfrac{7n}{7} \ge \dfrac{49}{7} \qquad\qquad \dfrac{-n}{-1} \ge \dfrac{0}{-1}$

$\boxed{n \ge 7}$ or $\boxed{n \le 0}$
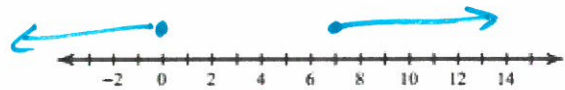
9.) Solve and graph linear absolute value inequalities on a number line.

$\dfrac{-4|x + 5|}{-4} \ge \dfrac{-12}{-4}$

$\boxed{|x+5| \le 3} \rightarrow$ CONJUNCTION

$x + 5 \le 3 \qquad\qquad -(x+5) \le 3$

$-5 \quad -5 \qquad\qquad \overline{-1}$

$x \le -2 \qquad\qquad \dfrac{x+5}{-5} \ge \dfrac{-3}{-5}$

 **AND** $x \ge -8$

$|6y - 12| + 17 > 41$

$-17 \quad -17$

$\boxed{|6y - 12| > 24} \rightarrow$ DISJUNCTION

$6y - 12 > 24 \qquad\qquad -(6y-12) > 24$

$+12 \quad +12 \qquad\qquad 6y - 12 < -24$

$ +12 \qquad +12$

$\dfrac{6y}{6} > \dfrac{36}{6} \qquad\qquad \dfrac{6y}{6} < \dfrac{-12}{6}$

$\boxed{y > 6}$ OR $\boxed{y < -2}$
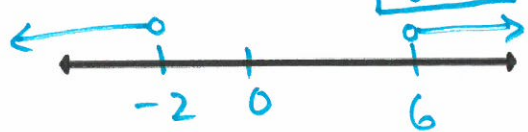
Function Family Review

Label with the function family and a descriptive word.

$f(x) = -3^x$ EXPONENTIAL (DECREASING)

$f(x) = -2x - 4$ LINEAR (DECREASING)

$f(x) = |3x + 1| + 7$ ABSOLUTE-VALUE (minimum)

$f(x) = 2x^2 + x - 1$ QUADRATIC (minimum)

$$f(x) = \begin{cases} -2x + 10, & -\infty \leq x < 3 \\ 4, & 3 \leq x < 7 \\ -2x + 18, & 7 \leq x \leq +\infty \end{cases}$$ LINEAR PIECEWISE

$f(x) = \dfrac{2}{x}$ RATIONAL (DECREASING)

$f(x) = -4\sqrt{x - 1}$ RADICAL (DECREASING)