

Semester 1 Exam Review

Chapter 1

Write the difference of twice a number and eight as an algebraic expression.

$$2x - 8$$

Write seven times the sum of four and a number as an algebraic expression.

$$7(4 + x)$$

Simplify $-7a - 10(2 + 10a)$

$$\underline{-7a} - 20 - \underline{100a}$$

$$\underline{-107a - 20}$$

Determine whether the relation is a function.

Yes!

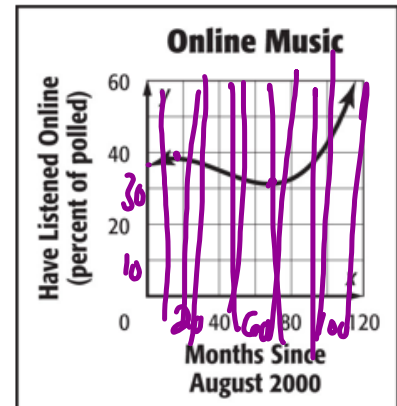
x	y
0	1
-2	-1
-4	1

~~0~~

a. Identify the function graphed as *linear* or *nonlinear*.

b. Estimate and interpret the y- intercept of the graph.

38



c. Identify the intervals for which the graph is increasing and decreasing.

inc 0 to 18

↓ 70 months ↓ on

dec 18 to 70

d. Is the graph a function?

Yes

Chapter 2

Translate into an equation.

Six times the number x decreased by 15 is 83.

$$6x - 15 = 83$$

Translate each equation into a sentence.

$$2(m + n) = 2x + 7$$

Two times the sum of m and n is equal to two times x plus 7

Solve

$$\frac{a}{-8} + 9 = -10$$

$$\frac{a}{-8} = (-19) - 8$$

$$a = 152$$

Solve

$$\cancel{\left(\frac{r+13}{12}\right)} = (1)12$$

$$\begin{array}{r} r+13=12 \\ -13 \quad -13 \end{array}$$

$$\boxed{r = -1}$$

Solve

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

$$\begin{array}{r} 8 + \cancel{4y} = -18 + 6y \\ \quad \quad \quad \quad \quad -4y \end{array}$$

$$\begin{array}{r} 8 = \cancel{-18} + 2y \\ +18 \quad +18 \end{array}$$

$$\frac{26}{2} = \frac{2y}{2}$$

$$13 = y$$

Solve the equation. Then graph the solution set. Show your work.

$$|2z - 15| = 1$$

$$\begin{array}{r} 2z - 15 = 1 \\ +15 \quad +15 \end{array}$$

$$\frac{2z}{2} = \frac{16}{2}$$

$$\begin{array}{r} 2z - 15 = -1 \\ +15 \quad +15 \end{array}$$

$$\frac{2z}{2} = \frac{14}{2}$$

$$\boxed{z = 8 \quad \text{or} \quad z = 7}$$

Solve the proportion. Show your work.

$$\frac{5}{12} = \frac{x+1}{4}$$

$$20 = 12(x+1)$$

$$20 = 12x + 12$$
$$-12 \quad -12$$

$$\frac{8}{12} = \frac{12x}{12}$$

$$\frac{8 \div 4}{12 \div 4} = x$$

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

State whether the percent of change is a percent of *increase* or a percent of *decrease*.
Then find the percent of change. Show your work.

original: 150
new: 225

$$\frac{\text{New} - \text{org}}{\text{org}}$$

$$\frac{225 - 150}{150} = \frac{75}{150} = \frac{1}{2} \text{ or } 50\% \text{ inc.}$$

Solve the equation for the variable indicated. Show your work.

14. mn + 7p = 8 for n

$$mn + \cancel{7p} = 8$$
$$\quad \quad \quad \cancel{-7p} \quad \quad -7p$$

$$\frac{mn}{m} = \frac{8-7p}{m}$$

$$n = \frac{8-7p}{m}$$

$$n = \frac{8}{m} - \frac{7p}{m}$$

16. **BIRD SEED** A nature center sells Premium Bird Seed for \$6.50 per pound and Economy Bird Seed for \$4.25 per pound. The nature center sells a mixture of the two kinds of seed for \$5.50 per pound. Let p represent the amount of Premium Bird Seed the nature center uses in 10 pounds of the mixture.

	Number of Pounds	Price per Pound	Cost
Premium Bird Seed	p	6.50	$6.50p$
Economy Bird Seed	$10-p$	4.25	$4.25(10-p)$
Mixture	10	5.50	$10(5.50) = 55$

b. Write an equation to represent the problem.

$$6.50p + 4.25(10 - p) = 55$$

c. How much Premium Bird Seed does the nature center use in 10 pounds of the mixture?

$$5.5 \text{ lbs}$$

d. How much Economy Bird Seed does the nature center use in 10 pounds of the mixture?

$$10 - 5.5 = 4.5 \text{ lbs}$$

$$\underline{6.50p} + 42.50 - \underline{4.25p} = 55$$

$$\begin{array}{r} 2.25p + 42.50 = 55 \\ -42.50 \quad -42.50 \end{array}$$

$$\begin{array}{r} 2.25p = 12.50 \\ \hline 2.25 \quad 2.25 \end{array}$$

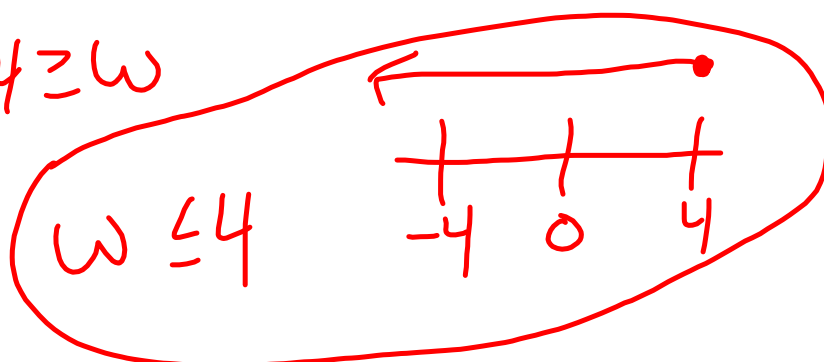
$$p = 5.5 \text{ lbs}$$

Chapter 5

Solve and graph

$$\begin{array}{r} -2 \geq w - 6 \\ +6 \quad \quad +6 \end{array}$$

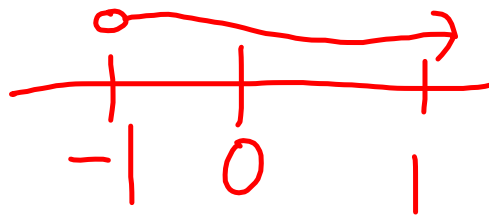
$$4 \geq w$$



Solve and graph

$$\frac{-10f}{-10} < \frac{10}{-10}$$

$$f > -1$$



Solve and graph

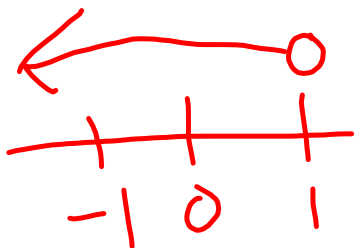
$$\frac{5x - 3 + 4x}{6} < 1$$

~~$$6 \left(\frac{9x - 3}{6} \right) < (1) 6$$~~

$$9x - 3 < 6$$

$$\begin{array}{ccc} & +3 & +3 \end{array}$$

$$\frac{9x}{9} < \frac{9}{9}$$



$$x < 1$$

Solve and graph.

$$-12(3z + 1) < -12(3z - 3)$$

$$\cancel{-36z} - 12 < \cancel{-36z} + 36$$

$$-12 < 36$$

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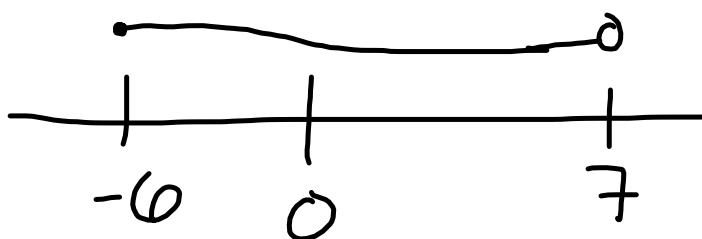
(R)

Solve and graph.

$$u + 7 \geq 1 \quad \text{and} \quad u - 5 < 2$$

$-7 \quad -7 \qquad +5 \quad +5$

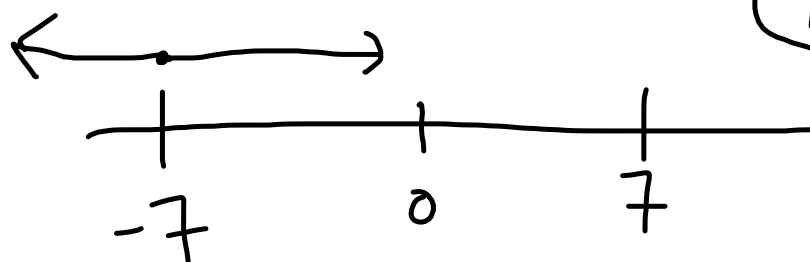
$$u \geq -6 \quad \downarrow \quad u < 7$$



Solve and graph.

$$\cancel{3} + v \leq \frac{-4}{-3} \text{ or } \frac{-2v}{-2} \leq \frac{14}{-2}$$

$$v \leq -7 \text{ or } v \geq -7$$



\mathbb{R}

$$\text{Solve } |d - 5| \geq 10.$$

OR

$$\begin{array}{r} d - 5 > 10 \\ +5 \quad +5 \end{array}$$

or

$$\begin{array}{r} d - 5 < -10 \\ +5 \quad +5 \end{array}$$

$$d > 15 \quad \text{or} \quad d < -5$$

Solve $|p - 2| < 7$
and

$$\begin{array}{c} -7 < p - 2 < 7 \\ +2 \quad +2 \quad +2 \end{array}$$

$$-5 < p < 9$$

Chapter 3

Which equation is *not* a linear equation?

a. $-4v + 2w = 7$

b. $y = 10$

c. $x = -5$

~~d. $x + y^2 = 6$~~

What is the standard form of $y - 7 = -\frac{2}{3}(x + 1)$?

$$Ax + By = C$$

$$y - 7 = -\frac{2}{3}x - \frac{2}{3}$$

$$+\frac{2}{3}x \quad +\frac{2}{3}x$$

$$\frac{2}{3}x + y - 7 = -\frac{2}{3} \quad 7 - \frac{2}{3}$$

$$+7 \quad +7$$

$$3\left(\frac{2}{3}x + y = 6\frac{1}{3}\right) \quad \frac{19}{3}$$

$$2x + 3y = 19$$

What is the slope of the line through (1, 9) and (-3, 16)?

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

$$m = \frac{16 - 9}{-3 - 1} = \frac{7}{-4}$$

Solve (find the root) of the equation.

$$2x - \cancel{3y} = 30$$

x-int (x, 0)

$$\frac{2x}{2} = \frac{30}{2}$$

$$x = 15$$

If y varies directly as x and $y = 3$ when $x = 10$, find x when $y = 8$.

$$y = kx$$

$$\frac{3}{10} = \frac{k \cdot 10}{10}$$

$$\frac{3}{10} = k$$

$$y = \frac{3}{10}x$$

$$\frac{10}{3} \left(\frac{8}{1} \right) = \left(\frac{3}{10} x \right) \frac{10}{3}$$

$$\frac{80}{3} = x$$

Determine which sequence is *not* an arithmetic sequence.

a. $-7, 0, 7, 14, \dots$
 $+7 \quad +7 \quad +7$

b.

$0, \frac{1}{2}, 1, \frac{3}{2}, \dots$
 $+\frac{1}{2} \quad +\frac{1}{2} \quad +\frac{1}{2}$

c. $10, 6, 2, -2, \dots$
 $-4 \quad -4 \quad -4$

d.

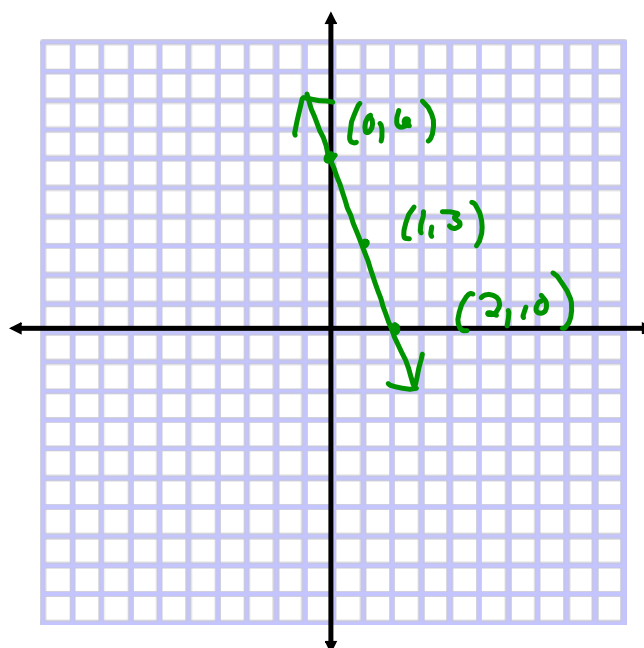
$2, 4, 8, 16, \dots$
 $+2 \quad +4 \quad +8$

Chapter 4

Write an equation in slope-intercept form for a line with a slope of 6 and a y-intercept of 72.

$$y = mx + b$$
$$y = 6x + 72$$

Graph a line with a slope of $-\frac{3}{1}$ and a y-intercept of 6.



Write an equation in slope-intercept form for a line that passes through the points $(2, -5)$ and $(-6, 15)$

$$m = \frac{15 + 5}{-6 - 2} = \frac{20 \div 4}{-8 \div 4} = \frac{5}{-2}$$

$$y = mx + b$$

$$-5 = \frac{5}{-2}x + b$$

$$-5 = -5 + b$$

$$+5 \quad +5$$

$$0 = b$$

$$y = \frac{5}{-2}x + 0$$

$$y = \frac{5}{-2}x$$

Write an equation in point-slope form for a line that passes through (6,13) and has a slope of $\frac{2}{7}$.

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

$$y - 13 = \frac{2}{7}(x - 6)$$

Write an equation in point-slope form for a line that goes through the points (3, 10) and (7, 2)

$$m = \frac{10-2}{3-7} = \frac{8}{-4} = \boxed{-2}$$

$$\begin{aligned} y-2 &= -2(x-7) \\ y-10 &= -2(x-3) \end{aligned}$$

Write an equation in slope-intercept form for a line that goes through $(2, 9)$ and is parallel to the line $y = 13x - 6$.

$$m = 13$$

$$y = 13x - 17$$

$$y = mx + b$$

$$9 = 13 \cdot 2 + b$$

$$9 = 26 + b$$
$$\begin{array}{r} -26 \\ -26 \end{array}$$

$$-17 = b$$

Write an equation in slope-intercept form for a line that is perpendicular to the line $y = (-3/8)x + 4$ and goes through $(0, 7)$

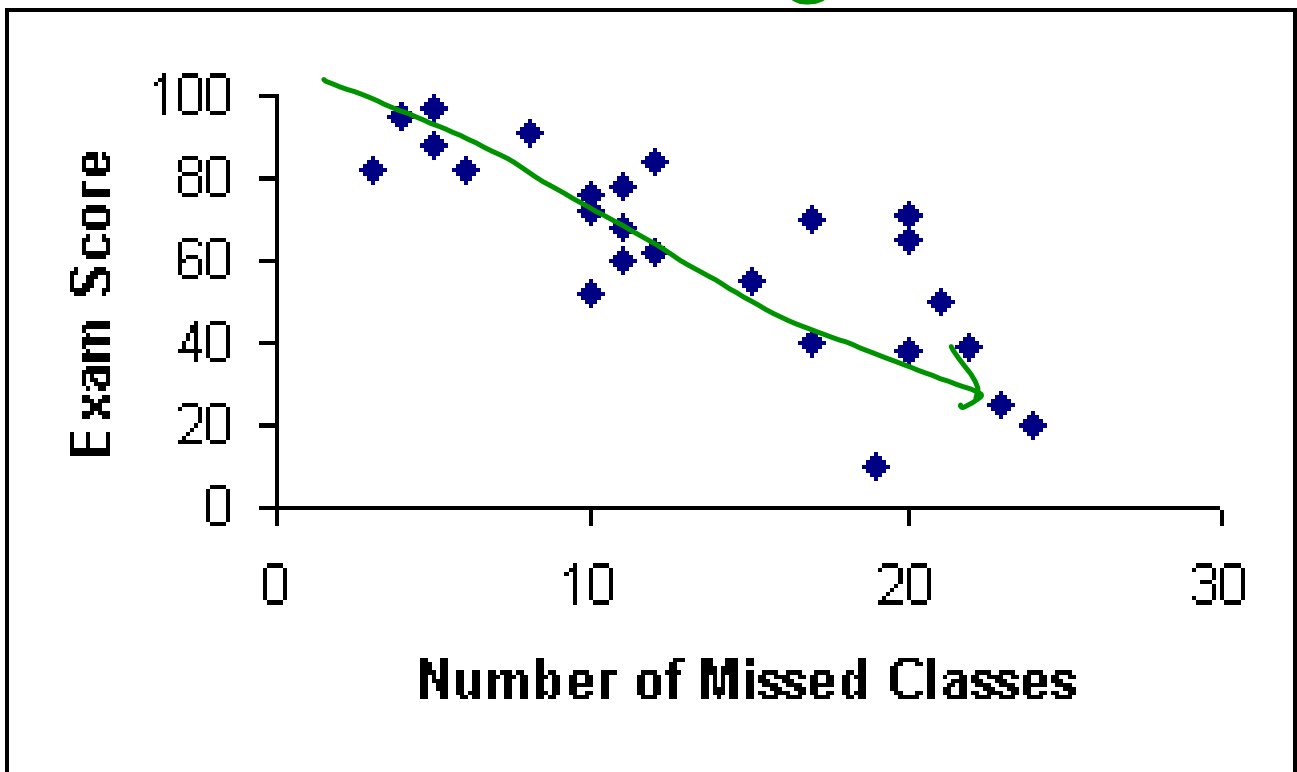
$$m = \frac{8}{3}$$

$$b = 7$$

$$y = \frac{8}{3}x + 7$$

State whether the data represents a positive correlation, negative correlation, or no correlation.

neg.



Find the inverse of the function $f(x) = -5x - 2$

$$y = -5x - 2$$

$$x = -5y - 2$$

$$\frac{x+2}{-5} = \frac{-5y}{-5}$$

$$\frac{x+2}{-5} = y$$

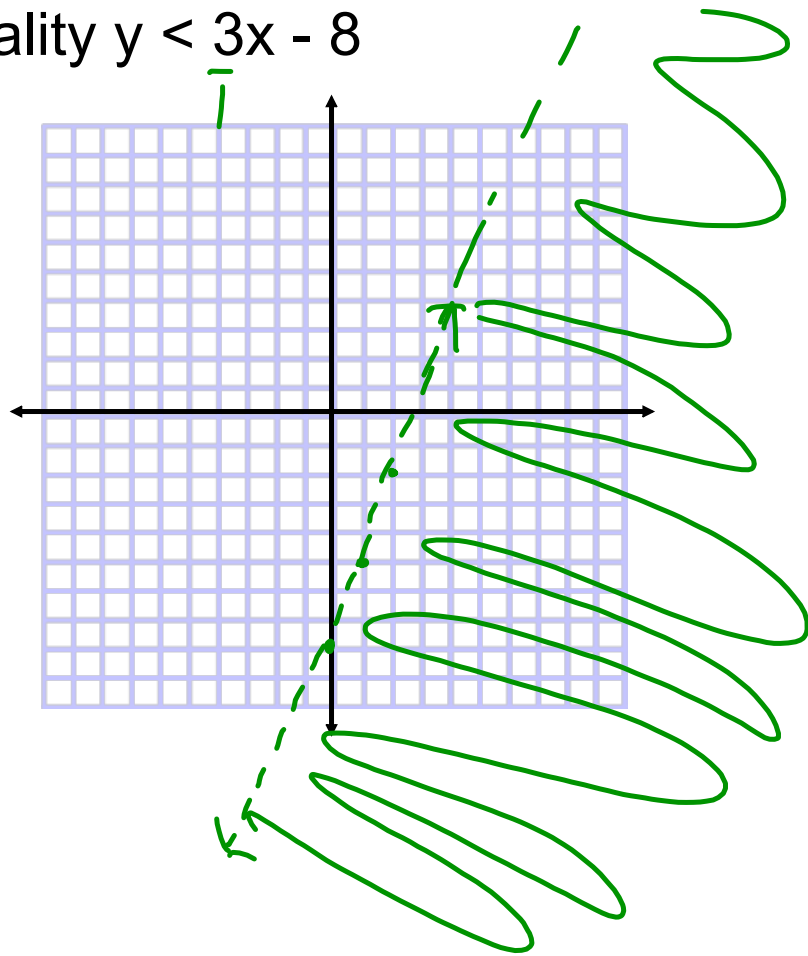
$$\frac{1}{5}x - \frac{2}{5} = y$$

$$f^{-1}(x) = \frac{x+2}{-5}$$

$$f^{-1}(x) = \frac{1}{5}x - \frac{2}{5}$$

Graph the inequality $y < 3x - 8$

$(0, 0)$
 $0 < 3(0) - 8$
 $0 < 0 - 8$
 $0 < -8$
F



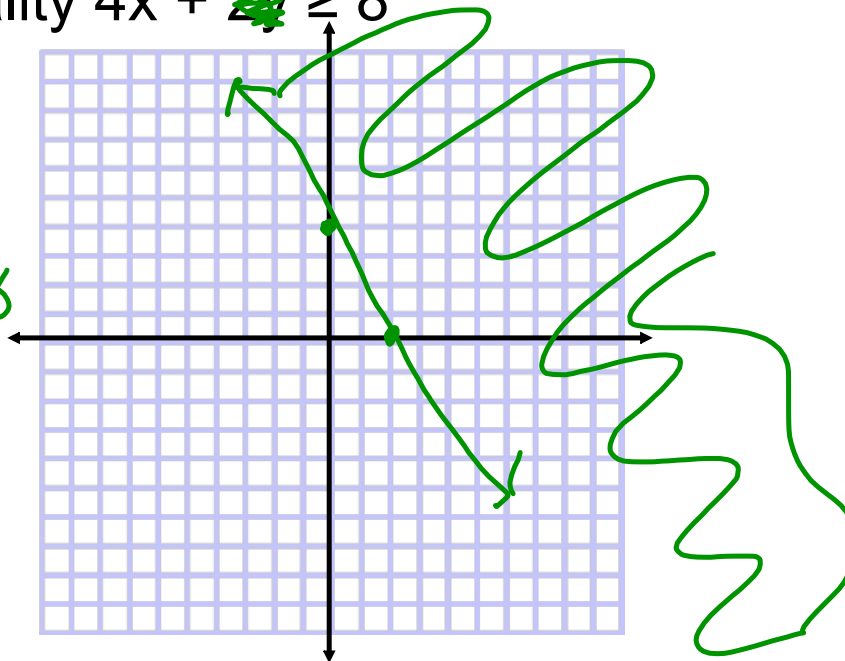
Graph the inequality $4x + 2y \geq 8$

$$(0, 0)$$

$$4(0) + 2(0) \geq 8$$

$$0 \geq 8$$

F



Eric is buying Butterfinger candy bars and bags of M&Ms. The candy bars cost \$1.50 each and each bag of M&Ms cost \$2.00. Eric has 35 dollars to spend. Write an inequality to represent the situation.

$$1.5x + 2y \leq 35$$

State a solution to the inequality.

