

**Unit 1 (A-CED.2, A-CED.4, and A-REI.3)**

1. Solve the equation for  $y$ :  $12y - 65 = 45 + 2y$

- A. 11
- B. 110
- C. 7.9
- D. 1

$$\begin{array}{r}
 12y - 65 = 45 + 2y \\
 \underline{-2y} \qquad \qquad \qquad \underline{-2y} \\
 10y - 65 = 45 \\
 \underline{+65} \qquad \qquad \underline{+65} \\
 10y = 110 \\
 \underline{10} \qquad \qquad \underline{10} \\
 y = 11
 \end{array}$$

2. A campsite charges ~~\$12~~ **\$12 per day** for the site rental and a **one-time charge of \$8** for parking. Assume you are staying for at least one day. What is the equation for the total campsite charges? Using your equation, evaluate the total campsite charges for 6 days.

- $12x + 8$   
 $12(6) + 8 = 80$
- A.  $C = 12d + 8$ , total \$132
  - B.  $C = 12d + 8$ , total \$80
  - C.  $C = 8d + 12$ , total \$60
  - D.  $C = 8d + 12$ , total \$98

3. Maria gets paid a flat rate of \$20.00 to babysit her nephew plus an additional \$5.00 per hour to clean the house. The money she earns is represented by the equation  $m = 5h + 20$ , where  $m$  represents the amount of money she earns, in dollars, and  $h$  is the number of hours she cleans the house.

Which of the following equations can be used to find  $h$ , the number of hours she cleans the house for?

- A.  $h = m - 25$
- B.  $h = \frac{m-20}{5}$
- C.  $h = \frac{m}{20}$
- D.  $h = m - 5$

Solve for  $h$ :

$$\begin{array}{r}
 m = 5h + 20 \\
 \underline{-20} \qquad \qquad \underline{-20} \\
 \frac{m-20}{5} = \frac{5h}{5}
 \end{array}$$

4. Which of these equations is equivalent to:  $y = mx + b$ ?

- A.  $x = y - b$
- B.  $b = y + mx$
- C.  $x = \frac{y-b}{m}$
- D.  $b = \frac{y}{m-x}$

Solve for  $x$ :

$$\begin{array}{r}
 y = mx + b \\
 \underline{-b} \qquad \qquad \underline{-b} \\
 \frac{y-b}{m} = \frac{mx}{m}
 \end{array}$$

Solve for  $b$ :

$$\begin{array}{r}
 y = mx + b \\
 \underline{-mx} \qquad \underline{-mx} \\
 y - mx = b
 \end{array}$$

5. A construction company's cost to build a new home is \$35,000 plus \$95 for each square foot of floor space.

a. Write an equation for the cost,  $c$ , to build a house with  $f$  square feet of floor space.

$$C = 35,000 + 95f$$

b. Use your equation to determine how much it will cost to build a house that contains 1600 square feet.

$$\begin{aligned}
 C &= 35,000 + 95(1600) \\
 C &= 35,000 + 56,000 \\
 \boxed{C} &= \boxed{\$91,000}
 \end{aligned}$$

Unit 2 (A-REI.10, F-IF.2, F-IF.4)

1. Brian has 64 flowers for party decorations. He is planning to buy some flower arrangements that have 18 flowers each. Brian has enough money to buy five arrangements. His wife is not sure how many arrangements will be purchased. Select the function that best models the situation.

- A.  $f(x) = 18x + 64$       B.  $f(x) = 64 + x$   
 C.  $f(x) = 64x + 18$       D.  $f(x) = 5x + 64$

$18x + 64$

Domain =  
5 arrangements

2. A pool that is being drained contained 12,000 gallons of water. After 2 hours, 9,500 gallons of water remain. Write an equation to model the situation.

- A.  $y = -2x + 9500$       B.  $y = -1250x + 12000$   
 C.  $y = 2x + 9500$       D.  $y = -1250x + 9500$

$\frac{12000 - 9500 \text{ gal}}{2 \text{ hrs}} = \frac{2500 \text{ gal}}{2 \text{ hrs}}$

$= \frac{1250 \text{ gal}}{1 \text{ hr}}$

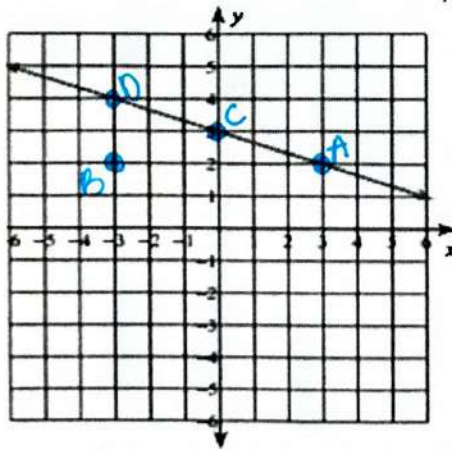
3. Which intercepts best represent the graph of:  $5x + 10y = 10$ ?

- A. x-intercept = 5; y-intercept = 10  
 B. x-intercept = 10; y-intercept = 5  
 C. x-intercept = 2; y-intercept = 1  
 D. x-intercept = 1; y-intercept = 2

x-int  
 $\frac{5x = 10}{5} \quad | \quad \frac{10}{5}$   
 $x = 2$

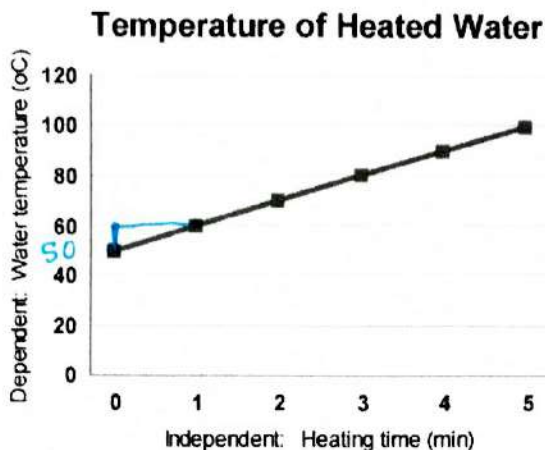
y-int  
 $\frac{10y = 10}{10} \quad | \quad \frac{10}{10}$   
 $y = 1$

4. Given the following graph of a linear function,  $f(x)$ , which of the following is FALSE?



- A.  $f(3) = 2$       B.  $f(-3) = 2$   
 C.  $f(0) = 3$       D.  $f(-3) = 4$

5. The graph below shows the temperature of water depending on the number of minutes it has been heated on a standard stove.



$$\frac{\text{rise}}{\text{run}} = \frac{10^\circ}{1\text{min}} = 10$$

The table shows the temperature of water depending on the number of minutes it has been heated on a New Wave cooktop.

Heating time (min)	Water Temperature (°C)
1.5	72.3
2.5	84.3
3.5	96.3

+1

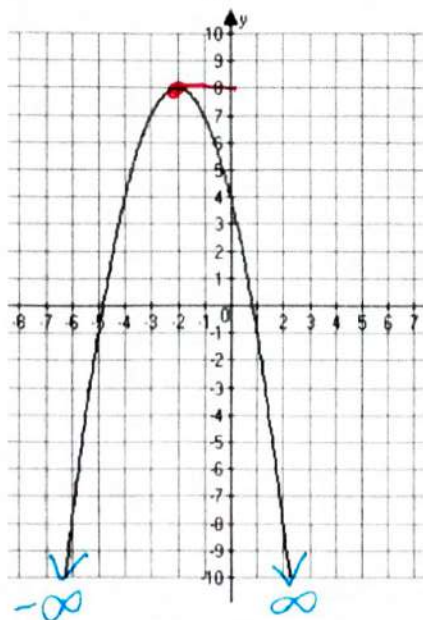
> +12

$$\frac{\Delta y}{\Delta x} = \frac{12^\circ}{1\text{min}} = 12$$

Which of the following statements correctly describes which heating unit works faster?

- A. Standard stove because the temperature per minute is about 10.
- B. Standard stove because at 3 minutes the temperature is about 80 °C, while the New Wave is at 96.3 °C.
- C. New Wave because the temperature per minute is about 12.
- D. New Wave because at 4 minutes the temperature is 100 °C, while standard stove is 85 °C.

6. State the domain and range of the function shown in the graph.



~~D:  $-4 \leq x \leq 1$~~

~~A. R:  $0 \leq y \leq 4$~~

B. D: all real #'s

R:  $y \leq 8$

~~C. D: all real #'s~~

~~R:  $y \geq -1$~~

~~D. D:  $\mathbb{R}$~~

~~R:  $\mathbb{R}$~~

Domain

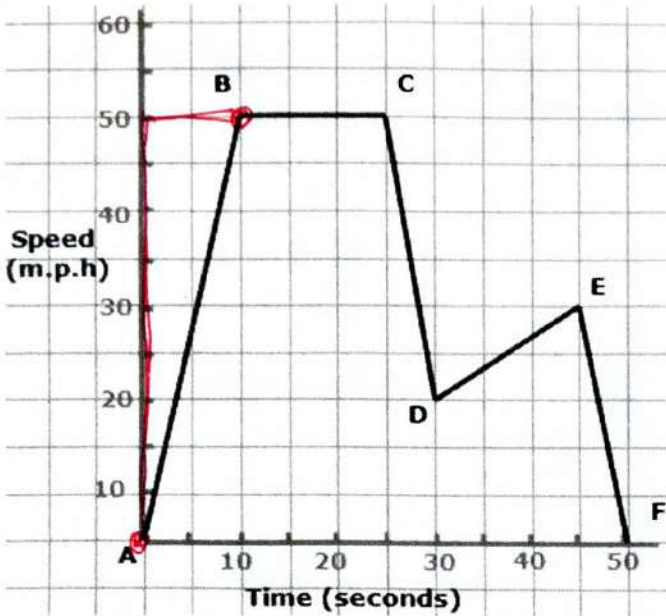
Left → Right  
x-axis  
 $(-\infty, \infty)$

Range

Bottom → Top  
y-axis  
 $(-\infty, 8]$

7. What is the slope from 0 seconds to 10 seconds and what does it represent?

$$\frac{\text{rise}}{\text{run}} = \frac{50 \text{ mph}}{10 \text{ sec}} = 5$$



A. The rate of change is 5. There was an increase of 5 miles per hour in that interval.

B. The rate of change is 50. There was an increase of 50 miles per hour in that interval.

C. The rate of change is 50. There was an increase of 5 miles per hour in that interval.

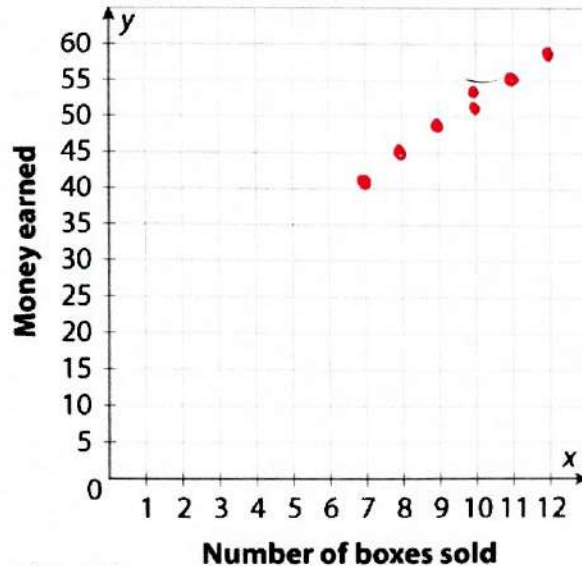
D. The rate of change is 5. There was an increase of 50 miles per hour in that interval.

8. For the following relation, the input,  $x$ , is the ages of boys and the output,  $y$ , is their corresponding height, in inches.  $\{(7,41), (8,45), (9,49), (10,52), (10,53), (11,55), (12,59)\}$

a. Fill the values in the table.

x	y
7	41
8	45
9	49
10	52
10	53
11	55
12	59

b. Plot the points on the graph.



c. Is the relation above a function? Why or why not?

No, because 10 repeats twice in the input.

d. What is the domain?

$$D: \{7, 8, 9, 10, 11, 12\}$$

e. What is the range?

$$R: \{41, 45, 49, 52, 53, 55, 59\}$$

9. The relation represents the age of each student and the number of pets the student has.

a. What is the domain?

D: {4, 6, 7, 9}

b. What is the range?

R: {0, 4, 5, 6}

c. Is it a function? Explain.

NO, because 9 repeats twice in the input.

Age $x$	Number of Pets $y$
4	5
6	4
7	0
9	6
9	4

10. A hot air balloon is 750 meters above the ground and begins to descend at a constant rate of 25 meters per minute. The function  $f(x) = 750 - 25x$  represents the height of the hot air balloon after  $x$  minutes.

a. What is the slope? What does it mean in this context?

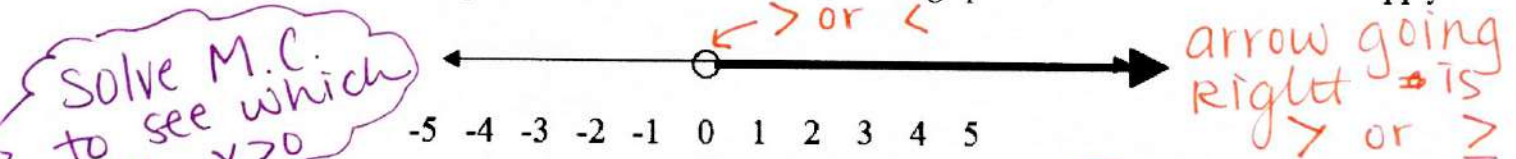
Slope is -25. Hot air balloon is going down 25 meters per minute.

b. What is the y-intercept? What does it mean in this context?

y-int is 750. Hot air balloon started 750m above ground.

Unit 3 (A-REI.3, A-CED.1, A-REI.12)

1. Which of the following inequalities have solutions that would be graphed as shown? Select all that apply.



- A.  $2x > 0$
- B.  $6 + 2x > 4 + 3x$
- C.  $4 + 2x < 4 + 3x$
- D.  $6 > 4 + 3x$
- E.  $6 - 2x < 4$

(E) 
$$\begin{array}{r} 6 - 2x < 4 \\ -6 \quad -6 \\ \hline -2x < -2 \\ \div -2 \quad \div -2 \\ \hline x > 1 \end{array}$$

(A) 
$$\begin{array}{r} 2x > 0 \\ \div 2 \quad \div 2 \\ \hline x > 0 \end{array}$$

(B) 
$$\begin{array}{r} 6 + 2x > 4 + 3x \\ -4 \quad -2x \quad -4 \quad -2x \\ \hline 2 > x \end{array}$$

(C) 
$$\begin{array}{r} 4 + 2x < 4 + 3x \\ -4 \quad -3x \quad -4 \quad -3x \\ \hline -x < 0 \\ \div -1 \quad \div -1 \\ \hline x > 0 \end{array}$$

(D) 
$$\begin{array}{r} 6 > 4 + 3x \\ -4 \quad -4 \\ \hline 2 > 3x \\ \div 3 \quad \div 3 \\ \hline \frac{2}{3} > x \end{array}$$

2. Solve:  $6 + 2x > 4 + 3x$

A.  $x < -2$

B.  $x > -2$

C.  $x < 2$

D.  $x > 2$

$$\begin{array}{r|l} 6 + 2x > 4 + 3x & \\ -3x & -3x \\ \hline 6 - 1x > 4 & \\ -6 & -6 \\ \hline -1x > -2 & \\ \frac{-1x}{-1} > \frac{-2}{-1} & \\ x < 2 & \end{array}$$

3. A store pays managers \$12.00 per hour, and all other employees \$8.00 per hour. Their budget allows them to pay at most \$3,000 per month to their employees. Letting  $m$  stand for the hours managers work and  $e$  stands for the number of hours other employees work, which of the following inequalities represent the store's budget?

A.  $12m + 8e < 3,000$

B.  $12m + 8e > 3,000$

C.  $12m + 8e \geq 3,000$

D.  $12m + 8e \leq 3,000$

4. Alfredo makes \$5.00 per hour working at a movie theater and \$8.00 per hour working at a restaurant. Next week, Alfredo is scheduled to work 6 hours at the movie theater. Which of the following inequalities represent the amount of hours ( $h$ ) that Alfredo needs to work at the restaurant next week to earn at least \$124 between his two jobs?

A.  $8h + 5h \geq 124$

B.  $8h - 5(6) \geq 124$

C.  $8h + 5(6) \geq 124$

D.  $8(6) + 5(6) \geq 124$

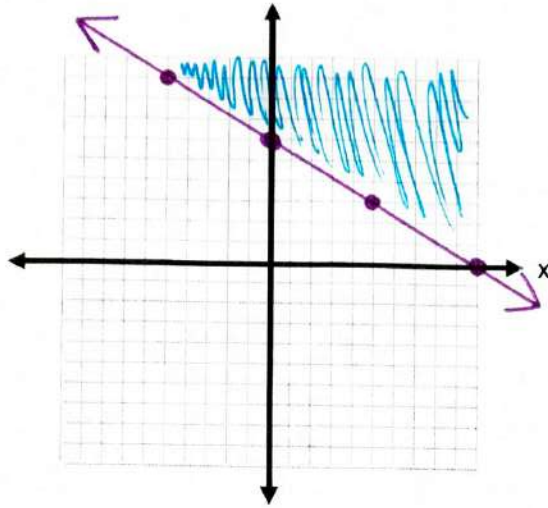
$$\begin{array}{l} \text{movie} \quad \text{rest.} \\ 5h + 8h \geq 124 \\ 5(6) + 8h \geq 124 \end{array}$$

5. Solve  $x + 1 > -5(7 - 2x)$ .

$$\begin{array}{r|l} x + 1 > -35 + 10x & \\ -x & -x \\ \hline 1 > -35 + 9x & \\ +35 & +35 \\ \hline 36 > 9x & \\ \frac{36}{9} > \frac{9x}{9} & \\ 4 > x & \end{array}$$

Solid Above

6. Graph  $y \geq -\frac{3}{5}x + 6$



$m = -\frac{3}{5}$  rise  
5 run

$b = 6$

Unit 4 (A-REI.5, A-REI.11, A-REI.12, F-LE.2)

1. Find the sum of the first equation and twice the second equation.

ADD

$$\begin{array}{r} 2x + 4y = 6 \\ + \quad 1x + 1y = 2 \\ \hline 3x + 5y = 8 \end{array}$$

A.  $3x + 5y = 8$

B.  $x + 3y = 4$

C.  $4x + 8y = 10$

D.  $4x + 6y = 10$

2. Solve the system:  $\begin{cases} 2x + 3y = 18 \\ 5x - y = 11 \end{cases}$

$$\begin{array}{r} 10x + 15y = 90 \\ -10x + 2y = -22 \\ \hline 17y = 68 \\ \frac{17y}{17} = \frac{68}{17} \\ y = 4 \end{array}$$

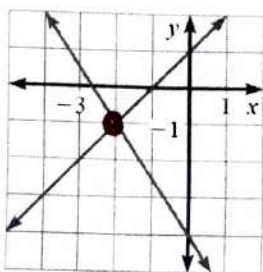
A.  $(4, 3)$

B.  $(3, -4)$

C.  $(-4, 3)$

D.  $(3, 4)$

3. Identify the point of intersection.



Point of intersection:

A.  $(-1, -2)$

B.  $(2, 1)$

C.  $(-2, -1)$

D.  $(1, 2)$

4. A local car wash charges \$5 per wash and \$8 per wash and wax. At the end of a certain day, the total sales were \$340. The total number of washes and washes with wax was 50. Write a system and solve it. How many cars were washed and how many were washed and waxed?

$$x = \text{wash} \quad y = \text{wash} + \text{wax}$$

- A. Cars washed: 20, Cars washed and waxed 30  
 B. Cars washed: 30, Cars washed and waxed 20  
 C. Cars washed: 50, Cars washed and waxed 50  
 D. Cars washed: 50, Cars washed and waxed 30

$$\$ : 5x + 8y = 340$$

$$\# : -5(x + y = 50)$$

$$\begin{array}{r} 5x + 8y = 340 \\ -5x - 5y = -250 \\ \hline \end{array}$$

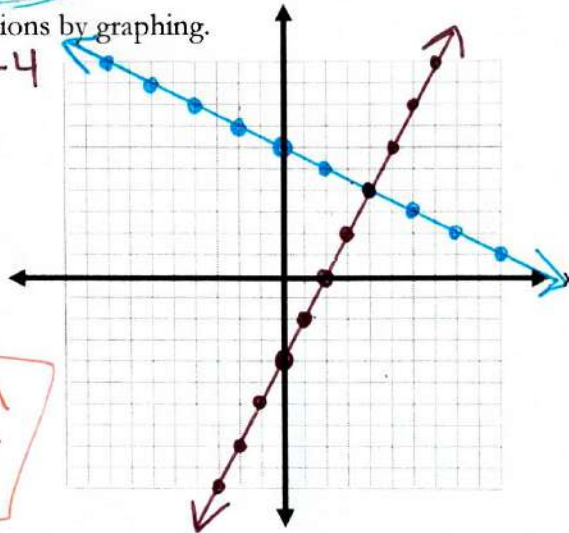
$$3y = 90 \quad y = 30$$

Plug in  
 $x + 30 = 50$   
 $x = 20$

5. Solve the system of linear equations by graphing.

$$\begin{cases} y = 2x - 4 & m = \frac{2}{1} \quad b = -4 \\ y = -\frac{1}{2}x + 6 & m = -\frac{1}{2} \quad b = 6 \end{cases}$$

$$m = -\frac{1}{2} \quad b = 6$$



Point of intersection  
 $(4, 4)$

6. A movie theater sells popcorn and fountain drinks. Brett buys 1 popcorn bucket and 3 fountain drinks for his family, and pays a total of \$9.50. Sarah buys 3 popcorn buckets and 4 fountain drinks for her family and pays a total of \$19.75. Let  $p$  represent the number of popcorn buckets and  $d$  represent the number of drinks.

a. Write the system of equations.

$$\begin{array}{r} 1p + 3d = 9.50 \\ 3p + 4d = 19.75 \end{array}$$

b. Solve the system of equations using elimination.

$$\begin{array}{r} -3(1p + 3d = 9.50) \\ 1(3p + 4d = 19.75) \\ \hline \end{array}$$

$$\begin{array}{r} -3p - 9d = -28.50 \\ 3p + 4d = 19.75 \\ \hline \end{array}$$

$$\begin{array}{r} -5d = -8.75 \\ -5 \quad -5 \\ \hline \end{array}$$

$$d = 1.75$$

Plug in

$$\begin{array}{r} 1p + 3(1.75) = 9.50 \\ 1p + 5.25 = 9.50 \\ -5.25 \quad -5.25 \\ \hline p = 4.25 \end{array}$$