

Name _____

ALGEBRA 1 MODULE 1

1. When factored completely, which is a factor of $12a^2 - 3a$?

- a. $12a$ b. $(4x^2 + 1)$ c. $3a$ d. $(4x - 1)$

2. Simplify: $\frac{(x - 7)^2}{x(x - 4) - 21}$

- a. -14 b. $\frac{7x+7}{2x-3}$ c. $\frac{1}{x+3}$ d. $\frac{x-7}{x+3}$

3. A person's hair is 8 centimeters long. The equation below can be used to estimate the length (L), in centimeters (cm), that the person's hair will be after w weeks.

$$L = \frac{w}{4} + 8$$

Based on the equation, what will be the estimated length of the person's hair after 10 weeks?

- a. 4.5 cm b. 8 cm c. 10 cm d. 10.5 cm

4. Ms. Bernard monitored the growth of a fish. The fish originally weighed 27 ounces. The fish grew at a rate of 5 ounces per month. The equation below can be used to describe the weight, in ounces, of the fish.

$$72 = 27 + 5x$$

Ms. Bernard correctly determined that $x = 9$. What does the solution of the equation mean?

- a. The fish grew at a rate of 9 ounces per month for 72 months.
b. The fish grew at a rate of 72 ounces per month for 9 months.
c. It took 9 months for the fish to grow to a weight of 72 ounces.
d. It took 72 months for the fish to grow to a weight of 9 ounces.

5. A system of equations is shown below.

$$\begin{aligned} 2x + 2y &= 10 \\ 5x - 2y &= 4 \end{aligned}$$

What is the solution of the system of equations?

- a. $(-2, -7)$ b. $(2, 7)$ c. $(2, 3)$ d. $(3, 2)$

6. Juan answered all 50 questions on a test. He earned 3 points for each question he answered correctly. He lost 1 point for each question he answered incorrectly. His final test score was 102 points. The system of equations below describes the relationship between the number of questions he answered correctly (x) and the number of questions he answered incorrectly (y).

$$\begin{aligned} x + y &= 50 \\ 3x - y &= 102 \end{aligned}$$

Part of the solution of the system of equations is $x = 38$. What does this value represent?

- a. the number of questions Juan answered correctly
b. the number of questions Juan answered incorrectly
c. the number of points Juan lost from questions he answered incorrectly
d. the number of points Juan earned from questions he answered correctly

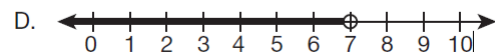
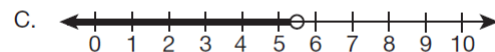
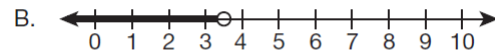
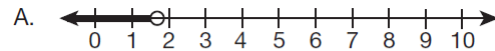
7. Jason decided that he will sell his stocks if their value per share (x) goes below \$5 or above \$15. Which compound inequality represents the values at which Jason will sell his stocks?

- a. $x > \$5$ or $x < \$15$
b. $x < \$5$ or $x > \$15$
c. $x > \$5$ and $x < \$15$
d. $x < \$5$ and $x > \$15$

8. An inequality is shown below.

$$4x + 2 < 2x + 9$$

Which graph shows the solution of the inequality?



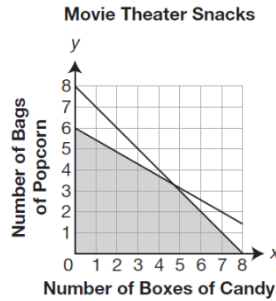
9. A ticket to a baseball game costs \$20. Each soda sold at the game costs \$5. Shawn may spend no more than \$50. He buys 1 ticket and x sodas. Shawn represents this situation with the inequality below.

$$5x + 20 \leq 50$$

The solution of the inequality is $x \leq 6$. Which statement **best** describes the solution of the inequality?

- a. Shawn buys 6 or fewer sodas.
- b. Shawn buys 6 or fewer tickets.
- c. Shawn buys 1 ticket and 5 sodas.
- d. Shawn has less than or equal to \$6 remaining when he leaves the game.

10. A group of friends will buy at most 8 snacks at a movie theater and spend no more than \$42. They will pay \$4 for each box of candy and \$7 for each bag of popcorn. The system of inequalities graphed below represents this information. Which combination of boxes of candy and bags of popcorn could the group buy?



- a. 2 boxes of candy and 6 bags of popcorn
- b. 3 boxes of candy and 4 bags of popcorn
- c. 5 boxes of candy and 4 bags of popcorn
- d. 8 boxes of candy and 1 bag of popcorn

CONSTRUCTED RESPONSE ITEMS

11. A large washtub already contains 6 gallons of water. A faucet is turned on and continues to fill the washtub at a rate of $\frac{1}{2}$ gallon per minute.

A. How many total gallons of water will be in the washtub when the faucet has been on for 5 minutes?

_____ gallons

When the faucet has been on for x minutes, there will be y gallons of water in the washtub.

B. Write a linear equation to model the number of gallons of water (y) in the washtub x minutes after the faucet has been turned on.

linear equation: _____

C. Using your equation, determine the number of minutes from when the faucet is turned on until there are exactly $23\frac{3}{4}$ gallons of water in the washtub.

_____ minutes

A second washtub already contains 2 gallons of water. A larger faucet is used to fill this washtub at a rate $1\frac{1}{2}$ times the rate of the first faucet. Both faucets are turned on at the same time.

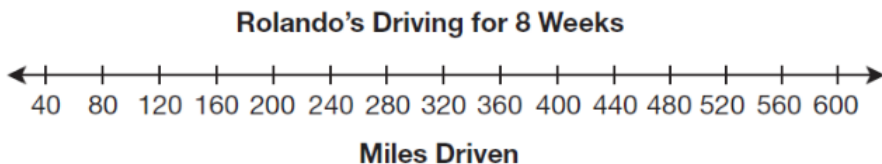
D. Determine the number of minutes until both washtubs contain the same number of gallons of water.

_____ minutes

CONSTRUCTED RESPONSE ITEMS

12. Rolando drives at least 40 miles but less than 60 miles each week.

A. Graph the compound inequality representing all of the possible distances Rolando could drive for 8 weeks.



B. Explain why you chose to use the symbols you used for the endpoints of the compound inequality in **part A**.

Rolando buys at least 8.5 but no more than 11 gallons of gas each week. The price of gas has ranged from \$2.40 to \$2.65 per gallon each week.

C. Write an inequality to model all of the possible amounts of money (m) Rolando spends on gas each week. Show or explain all your work.

Inequality: _____

ALGEBRA 1 MODULE 2

1. The set of ordered pairs shown below is a relation that is a function of x .

$$\{(1, 3), (2, 4), (3, 5), (4, 6)\}$$

Which ordered pair could be included in the set so that the relation remains a function of x ?

- a. (0, 4) b. (1, 6) c. (3, 3) d. (4, 7)

2. The table below represents a function of x .

x	y
-1	-13
2	-1
5	11
7	19

Which equation describes the function?

- A. $y = x - 12$ B. $y = 2x + 5$
 C. $y = 4x - 9$ D. $y = -4x + 13$

3. Aki wants to buy a music player that costs \$234 using only the money he earned from mowing lawns. The table below shows the amount of money Aki earned as a function of the number of lawns he mowed.

Aki's Mowing

Number of Lawns Mowed	Amount Earned (\$)
3	24
6	48
8	64
11	88

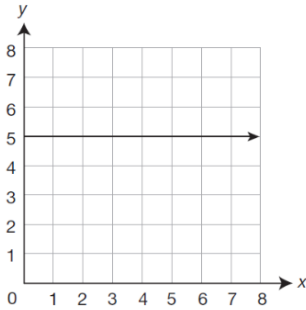
Based on the function shown in the table, what is the **least** number of lawns Aki will have to mow to buy the music player?

- a. 22 b. 29 c. 30 d. 31

4. LaShawn earned \$60.00 for working 8 hours this weekend. What is the total amount of money LaShawn would earn for working 34 hours at the same rate of pay?

- A. \$255 B. \$272 C. \$315 D. \$453

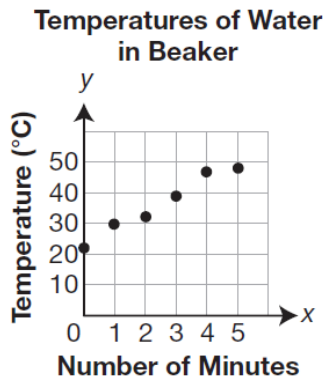
5. A function of x is graphed on the coordinate plane below.



What is the slope of the graph?

- A. 0 B. $\frac{1}{5}$ C. 5 D. undefined

6. Marcie heated a beaker of water in science class. The scatter plot below shows the temperature (y), in degrees Celsius ($^{\circ}\text{C}$), of the water based on the number of minutes (x) she heated the water.



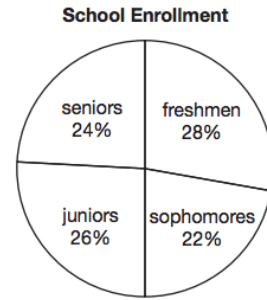
Which equation describes the line of best fit for the temperature of the water based on the number of minutes Marcie heated the water?

- A. $y = 5.3x + 12$ B. $y = 5.3x + 23$
 C. $y = -5.3x + 23$ D. $y = -5.3x + 50$

7. Javier's score on a science test is equal to the upper quartile value of all the scores on the test. Based on this information, which statement about Javier's score is most likely to be true?

- A. Javier's score is 75.
 B. Javier's score is greater than 75 other scores.
 C. Javier's score is the same as 75% of all the scores.
 D. Javier's score is greater than 75% of all the scores.

8. The circle graph below shows the percent of the total number of students enrolled in a high school who are in each grade.



There are currently 448 freshmen enrolled in the high school. About 75% of the seniors enrolled in the high school will attend college next year. Which is most likely the number of seniors currently enrolled in the high school who will attend college next year?

- A. 167 B. 288 C. 336 D. 384

9. Four violin students recorded the number of days they practiced violin each month for a year. Which stem-and-leaf plot has mode and median values that are equal?

A. **Number of Days Practiced Each Month**

0		
1		1 1 4
2		1 1 1 1
3		1 1 1 1 1

Key	
1	2 = 12 days

B. **Number of Days Practiced Each Month**

0		1 5 6 8 9
1		0 4 5 8
2		2 5
3		0

Key	
1	2 = 12 days

C. **Number of Days Practiced Each Month**

0		2 3 4 5 6 8
1		3 3
2		0 1
3		0 1

Key	
1	2 = 12 days

D. **Number of Days Practiced Each Month**

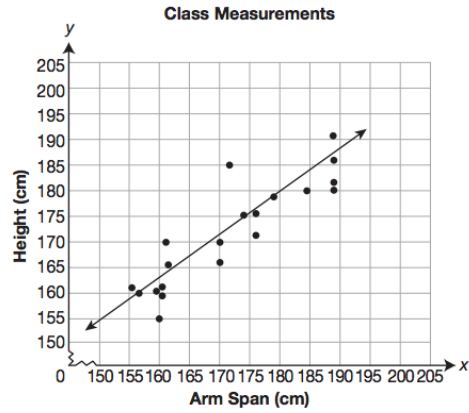
0		4 9
1		0 0 0 0 0 0
2		1 1
3		0 1

Key	
1	2 = 12 days

10. The scatter plot to the right shows the arm spans and heights of 20 people in Dorian's class.

Based on the line of best fit, which is most likely the height of a person with an arm span of 200 cm?

- A. 188 cm B. 192 cm C. 197 cm D. 205 cm



CONSTRUCTED RESPONSE ITEMS

11. A large bucket that is full of water has a small leak on the bottom. The bucket loses water at the rate of 0.5 gallon per minute. After 6 minutes the bucket contains exactly 9 gallons of water.

A. How many gallons of water were initially in the bucket?

_____ gallons

B. Write an equation in point-slope form to model the number of gallons (y) of water in the bucket after x minutes.

Point-slope equation: _____

C. How many minutes does it take for the bucket to lose 7.5 gallons of water?

_____ minutes

D. What is the total number of minutes it will take for the bucket to be completely empty?

_____ minutes

CONSTRUCTED RESPONSE ITEMS

12. Albert sells baseball programs at a stadium. The function $m(x) = 2.50x$ represents the total amount of money collected, in dollars, for selling x baseball programs.

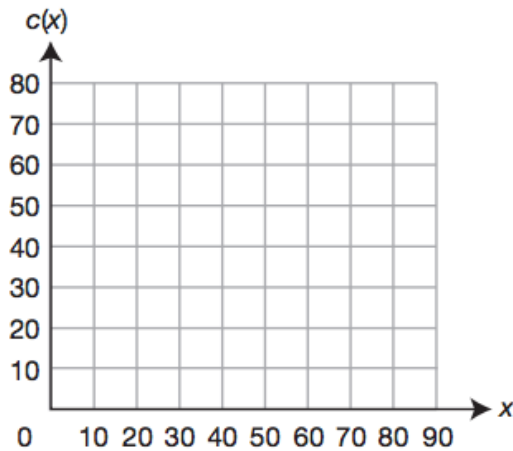
A. Fill in the table with the amounts of money collected for selling baseball programs.

Albert's Revenue

Baseball Programs Sold	Money Collected (\$)
150	
175	
197	

The cost, in dollars, to print up x programs for each game is represented by the function $c(x) = 0.50x + 40$.

B. On the grid below, draw a line that contains the coordinate points of the cost to print up x programs for each game.



In addition to his hourly wage, Albert earns a bonus when the amount of money collected is greater than the cost to print the total number of programs he sold. His bonus is equal to $\frac{1}{2}$ of the difference between the amount of money collected, $m(x) = 2.50x$, and the cost, $c(x) = 0.5x + 40$.

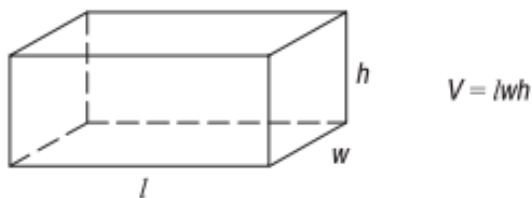
C. How much money does Albert earn as a bonus when he sells 309 baseball programs? Show all of your work. Explain why you did each step.

FORMULA SHEET

Formulas that you may need to work questions in this sampler are found below.

You may refer to this page at any time during this module.

You may use calculator π or the number 3.14.



Linear Equations

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

Point-Slope Formula: $(y - y_1) = m(x - x_1)$

Slope-Intercept Formula: $y = mx + b$

Standard Equation of a Line: $Ax + By = C$

Arithmetic Properties

Additive Inverse: $a + (-a) = 0$

Multiplicative Inverse: $a \cdot \frac{1}{a} = 1$

Commutative Property: $a + b = b + a$
 $a \cdot b = b \cdot a$

Associative Property: $(a + b) + c = a + (b + c)$
 $(a \cdot b) \cdot c = a \cdot (b \cdot c)$

Identity Property: $a + 0 = a$
 $a \cdot 1 = a$

Distributive Property: $a \cdot (b + c) = a \cdot b + a \cdot c$

Multiplicative Property of Zero: $a \cdot 0 = 0$

Additive Property of Equality:
If $a = b$, then $a + c = b + c$

Multiplicative Property of Equality:
If $a = b$, then $a \cdot c = b \cdot c$