

# Unit 6 Constructed-Response Review

Read the problem. Write your answer for each part.

- There is a linear relationship between the number of people in a group and the cost to enter a museum. The museum charges \$20 for two people and \$28 for three people.

A Write the equation in slope-intercept form that relates the number of people in a group to the cost of entering the museum. Show your work.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{28 - 20}{3 - 2} = \frac{8}{1} = 8$$

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

$$y - 20 = 8(x - 2)$$

$$y - 20 = 8x - 16$$

$$y = 8x + 4$$

Answer:  $y = 8x + 4$

- How much will it cost for a single individual to enter the museum?

$$y = 8(1) + 4$$

$$y = 8 + 4$$

$$y = 12$$

Answer: \$12

- How many people can enter the museum for \$100?

$$100 = 8x + 4$$

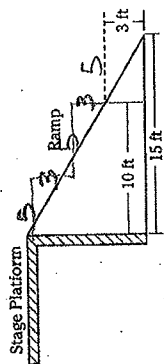
$$96 = 8x$$

$$x = 12$$

Answer: 12

Read the problem. Write your answer for each part.

- The bottom of a ramp is placed 15 feet from the edge of a stage platform. The ramp is 3 feet off the ground when it is 10 feet from the edge of the stage.



A What is the slope of the ramp? Show your work.

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

$$(15, 0) \quad (0, 3)$$

$$\frac{3 - 0}{0 - 15} = -\frac{3}{15} = -\frac{1}{5}$$

- How many feet off the ground is the top of the ramp?

9 ft

- Write a linear equation in slope-intercept form that represents the height ( $y$ ) of the ramp at any distance ( $x$ ) from the stage.

$$m = -\frac{3}{5} \quad (0, 9)$$

$$y = -\frac{3}{5}x + 9$$

Read the problem. Write your answer for each part.

3. Ashley is the manager of a theater. She has \$240 to spend on posters to advertise a new play. Ashley can spend exactly \$240 to print 48 small posters. She can also spend exactly \$240 to print 30 large posters.

A Write an equation that can be used to find all combinations of small posters ( $x$ ) and large posters ( $y$ ) that will cost exactly \$240.

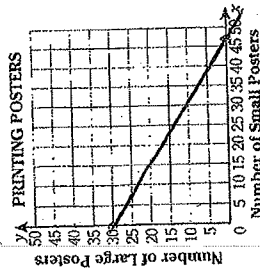
(48, 0) (0, 30)

$$\frac{30-0}{0-48} = \frac{30}{-48} = -\frac{5}{8}$$

$$y - 0 = -\frac{5}{8}(x - 48)$$

$$y = -\frac{5}{8}x + 30$$

B Graph your equation from part A below.



C What is the slope of the line you graphed in part B?

Answer:  $-\frac{5}{8}$

D Explain what the slope from part C means in this situation.

$-\frac{5}{8}$  large posters  
8 small posters

For every 8 small posters, she buy 5 fewer large posters.

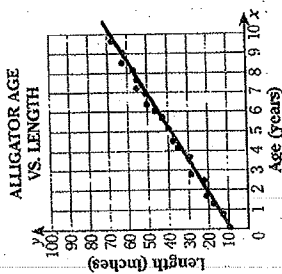
$$5x + 8y = 240$$

$$8y = -5x + 240$$

$$y = -\frac{5}{8}x + 30$$

Read the problem. Write your answer for each part.

4. The scatter plot below shows the age and length of 20 alligators.



- A Draw the line of best fit on the scatter plot above.

- B Write an equation that describes the line of best fit.

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{40 - 10}{5 - 0} = \frac{30}{5} = 6$$

Answer:  $y = 6x + 10$

- C Explain how you found your equation in part B.

I picked two points from the line and used the formula to find slope. I then used point-slope formula to find the equation of the line and then solved for y.

- D Explain the meaning of the slope of the line in this situation.

6 inches  
1 age every year. Alligators grow 6 inches every year.

(0, 10) (5, 40)

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

$$y - 10 = 6(x - 0)$$

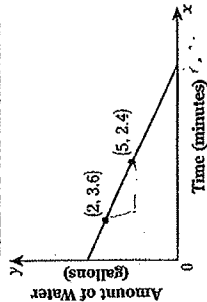
$$y - 10 = 6x - 0$$

$$y = 6x + 10$$

Read the problem. Write your answer for each part.

5. A kitchen sink is draining very slowly. The graph shows how the amount of water in the sink is changing over time.

DRAINING THE KITCHEN SINK



- A Find the slope of the line in the graph.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2.4 - 3.6}{5 - 2} = \frac{-1.2}{3} = -0.4$$

Answer:  $-0.4$

- B Write an equation of the line in point-slope form.

Answer:  $y - 3.6 = -0.4(x - 2)$

- C Find the x- and y-intercepts of the line.

$$0 = -0.4x + 4.4$$

$$-4.4 = -0.4x$$

$$x = 11$$

Answer:  $(11, 0)$  and  $(0, 4.4)$

- D Explain the meaning of the x- and y-intercepts in this situation.

In 11 minutes, 4.4 gallons of water will have been drained.

$$m = -0.4 \quad (2, 3.6)$$

$$y - 3.6 = -0.4(x - 2)$$

$$y - 3.6 = -0.4x + 0.8$$

$$y = -0.4x + 4.4$$

**MODULE 2: Linear Functions and Data Organizations**

**Standard A1.2.2**

Atava is traveling on a train.

The train is going at a constant speed of 80 miles per hour.

A. How many hours will it take for the train to travel 1,120 miles?

$$y = 80h$$

$$\frac{1120}{80} = \frac{80h}{80}$$

$$14 = h$$

hours: 14

Atava also considered taking an airplane. The airplane can travel the same 1,120 miles in 12 hours less time than it takes the train.

B. What is the speed of the airplane in miles per hour (mph)?

$$\frac{1120}{2} = \frac{r(2)}{2}$$

$$\frac{14}{-12} = \frac{2}{2}$$

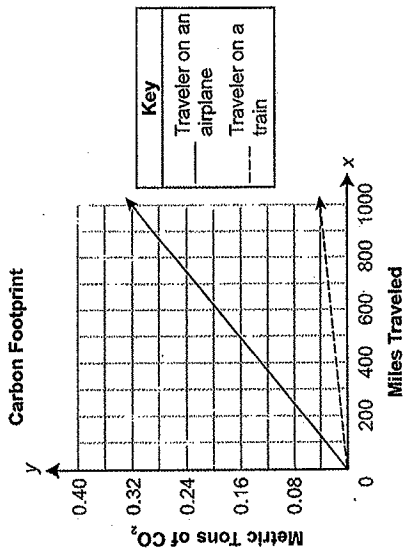
speed of the airplane: 560 mph

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**MODULE 2: Linear Functions and Data Organizations**

Continued. Please refer to the previous page for task explanation.

Atava is very concerned about the environment. The graph below displays the carbon dioxide (CO<sub>2</sub>) in metric tons, for each traveler on an airplane and each traveler on a train.



C. What equation could be used to find the metric tons of CO<sub>2</sub> produced (y) by a traveler on an airplane for x miles traveled?

$$(500, .16) \quad (1000, .32)$$

$$\frac{.32 - .16}{1000 - 500} = \frac{.16}{500}$$

equation:  $y = .00032x$

$$= .00032 \text{ or } \frac{1}{3125}$$

Continued on next page.

Algebra 1 - WH  
Open-ended HW Practice

name \_\_\_\_\_  
date \_\_\_\_\_ Period \_\_\_\_\_

Georgia is purchasing treats for her classmates. Georgia can spend exactly \$10.00 to purchase 25 fruit bars, each equal in price. Georgia can also spend exactly \$10.00 to purchase 40 granola bars, each equal in price.

A. Write an equation which can be used to find all combinations of fruit bars ( $x$ ) and granola bars ( $y$ ) that will cost exactly \$10.00.  $(25, 0)$   $(0, 40)$

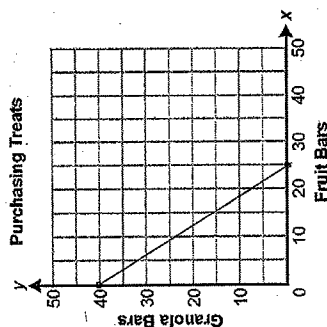
$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{40 - 0}{0 - 25} = \frac{40}{-25} = -1.6$$

$$y - 0 = -1.6(x - 25)$$

$$y = -1.6x + 40$$

equation:  $y = -1.6x + 40$

B. Graph the equation from part A below.



$a = \text{cost fruit bars}$   
 $b = \text{cost granola bars}$

$$\frac{25a}{25} = \frac{10}{25}$$

$$a = .4$$

$$\frac{40b}{40} = \frac{10}{40}$$

$$b = .25$$

$$.4x + .25y = 10$$

OR

$$.4x + .25y = 10$$

$$-.4x$$

$$.25y = -.4x + 10$$

$$\frac{.25y}{.25} = \frac{-.4x + 10}{.25}$$

$$y = -1.6x + 40$$

Continued. Please refer to the previous page for task explanation.

C. What is the slope of the line graphed in part B?

slope:  $-1.6$  or  $-\frac{8}{5}$

D. Explain what the slope from part C means in the context of Georgia purchasing treats.

$$\frac{-8 \text{ granola}}{5 \text{ fruit}}$$

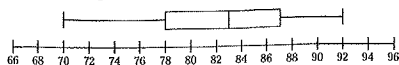
For every 5 fruit bars she buys, she can buy 8 less granola bars.

$\frac{8}{-5}$  For every 8 granola bars she buys, she can buy 5 fewer fruit bars.

# Unit 7 Constructed-Response Review

Read the problem. Write your answer for each part.

1. The box-and-whisker plot below shows students' scores on a practice driving test.



- A What is the range of the scores?

$$92 - 70 = 22$$

Answer: 22

- B What is the interquartile range?

$$87 - 78 = 9$$

Answer: 9

- C If the plot represents 64 students, about how many scored above the third quartile?

$$.25(64) = 16$$

Answer: 16 students

- D A passing score is 80. Explain how you know whether or not 50% of the students passed the test.

$$\text{median} = 83$$

50% of the students scored with an 83% or higher. The median is in the middle of the data. The passing score, 80%, falls into the lower half.

## Unit 7, Data Analysis

199

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7. Jason and Stephen went fishing. The stem-and-leaf plot shows the lengths of the fish each boy caught.

FISH LENGTHS	
Jason	Stephen
8 3 2 1 4 7	
3 3 2 0 6 8	
3 3 2 5	
0 4	

Key: 12 cm = 2 | 1 4 = 14 cm

According to the data, if one more fish is caught, what is the probability it will be more than 30 centimeters long?

- A  $\frac{2}{7}$  B  $\frac{3}{16}$  C  $\frac{2}{13}$  D  $\frac{3}{13}$

8. The box-and-whisker plot below shows the weight, in pounds, of each package a shipping company delivered one day.

PACKAGE WEIGHTS IN POUNDS



Which statement is **best** supported by the data in the box-and-whisker plot?

- A The median package weight was about 21 pounds.  
B The range in package weights was about 27 pounds.  
C More than half the packages weighed less than 18 pounds.  
D About one-fourth of the packages weighed between 21 and 27 pounds.

5. The box-and-whisker plot below shows the typing speed, in words per minute, of the students in Mr. Panko's typing class at the beginning of the year.

TYPING SPEED



Based on this plot, which of the following statements must be true?

- A Exactly one student types 35 words per minute.  
B Exactly one student types 37 words per minute.  
C Half of the students type 35 words per minute or less.  
D Half of the students type 37 words per minute or less.

6. The box-and-whisker plot shows the distribution of prices for 23 digital cameras for sale at an electronics store.

CAMERA PRICES (dollars)



Which is the **best** estimate for the median of the data?

- A \$380  
B \$225  
C \$275  
D \$300

Read the problem. Write your answer for each part.

3. Brittney randomly selected 30 cars in a parking lot and determined each car's year of manufacture. She made this stem-and-leaf plot to show the results.

CARS IN PARKING LOT—YEAR OF MANUFACTURE

197	1
198	2 6
199	3 4 5 5 7 7 8 9 9
200	1 2 4 5 5 6 7 7 8 9 9
201	0 0 1 1 2 2 2

Key: 197 | 1 = 1971

- A There are about 70,000 cars in the city where Brittney lives. According to Brittney's data, about how many of the cars in her city were manufactured before the year 2000?

$$\frac{12}{30} = .4 \quad 70,000(.4) = 28,000 \text{ cars}$$

Answer: 28,000 cars

- B Find the lower quartile and upper quartile of the data.

Answer: lower quartile = 1997 / upper = 2009

- C About how many of the cars in Brittney's city were manufactured between the years you found in part B?

$$50\% \rightarrow 35,000 \text{ cars}$$

Answer: \_\_\_\_\_

- D Explain how you found your answer to part C.

50% of the data is found between the lower and upper quartiles. So I divided 70,000 in half.

16

Read the problem. Write your answer for each part.

2. Isaac's bowling scores for April are shown below. His mean score after all five games was 221.

ISAAC'S BOWLING SCORES

Game	1	2	3	4	5
Score	225	245	222	230	?

- A What was Isaac's score in game 5?

$$221 = \frac{225 + 245 + 222 + 230 + x}{5}$$

Answer: 183  $1105 = 922 + x$

- B What was Isaac's median score for the five games?

$$x = 183$$

183, 222, 225, 230, 245

Answer: 225

- C Isaac bowls a sixth game and his median score changes to 227. What is Isaac's score on the sixth game?

$$183, 222, 225, \underline{229}, 230, 245$$

Answer: 229

- D Explain how you know your answer to part C is correct.

Because the median was affected with the 6<sup>th</sup> game, I knew that the game had to be either the 3<sup>rd</sup> or 4<sup>th</sup> highest score so that the mean is 227. Otherwise, the mean would not be 227. I then worked backwards knowing the mean is 227 and 1 of the other numbers is 225.