

## Unit 4: Describing Data

49) This table shows the average low temperature, in °F, recorded in Macon, Ga, and Charlotte, NC, over a six day period.

Day	1	2	3	4	5	6
Temperature, in °F, in Macon, GA	71	72	66	69	71	73
Temperature, in °F, in Charlotte, NC	69	64	68	74	71	75

$Q_1$     $Q_2$     $Q_3$   
 66 (69) 71 | 71 (72) 73  
 64 (68) 69 | 7 (74) 75

Which conclusion can be drawn from the data?

- IQR<sub>M</sub> = 3   IQR<sub>C</sub> = 6
- A. The interquartile range of the temperatures is the same for both cities NOPE!
- B. The lower quartile for the temperatures in Macon is lower than the lower quartile for the temperatures in Charlotte NOPE!  $Q_{1M} = 69$   $Q_{1C} = 68$
- TRUE! \*C. The mean and median temperatures of Macon were higher than the mean and median temperatures of Charlotte  
 Macon  $\bar{x} = 70.3$  median = 71  
 Charlotte  $\bar{x} = 70.1$  median = 70
- D. The upper quartile for the temperatures in Charlotte was lower than the upper quartile for the temperatures in Macon  
 $Q_{3C} = 74$   $Q_{3M} = 72$   
 NOPE!

50) A school was having a coat drive for a local shelter. A teacher determined the median number of coats collected per class and the interquartile ranges of the number of coats collected per class for the freshmen and for the sophomores.

- The freshmen collected a median number of coats per class of 10, and the interquartile range was 6
- The sophomores collected a median number of coats per class of 10, and the interquartile range was 4

$10 \xrightarrow{+6} 16$   
 $Q_2$     $Q_3$   
 $10 \xrightarrow{+4} 14$   
 $Q_2$     $Q_3$

Which range of numbers includes the third quartile of coats collected for both classes?

- A. 4 to 14   freshman  $Q_3$  could be up to 16
- B. 6 to 14   freshman  $Q_3$  could be up to 16
- \*C. 10 to 16
- D. 12 to 15   freshman  $Q_3$  could be up to 16

51) A reading teacher recorded the number of pages read in an hour by each of her students. The numbers are shown below.

44, 49, 39, 43, 50, 44, 45, 49, 51

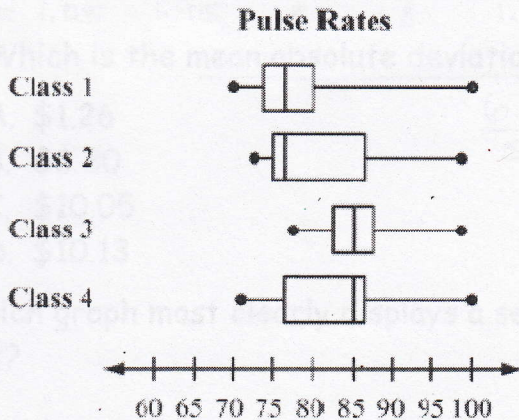
For this data, which summary statistic is NOT correct?

- A. The minimum is 39 True!
- \*B. The lower quartile is 44 False
- C. The median is 45 True!
- D. The maximum is 51 True!

39 43 | 44 44 (45) 49 49 50  
 → 43.5  
 $Q_1$    51

52) A science teacher recorded the pulse rates for each of her students in her classes after the students had climbed a set of stairs. She displayed the results, by class, using the box plots shown.

*All classes had similar max rates*



Which class had the highest pulse rates after climbing the stairs?

- A. Class 1
- B. Class 2
- C. Class 3
- D. Class 4

*\* C. Class 3 The "box" (50% of data) was highest for this class.*

53) Peter went bowling Monday to Friday, two weeks in a row. He only bowled one game each time he went. He kept track of his scores below.

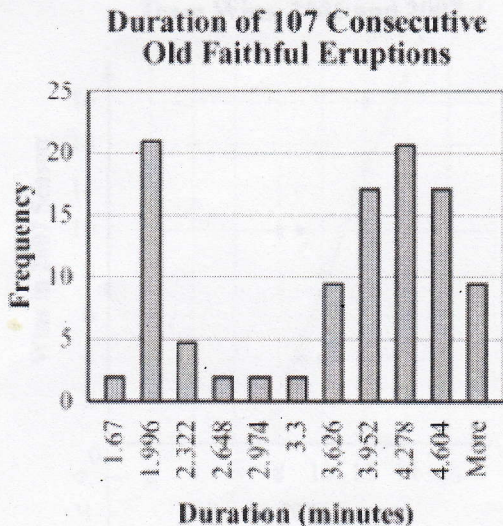
Week 1: 70, 70, 70, 73, 75

Week 2: 72, 64, 73, 73, 75 *64 72 73 73 75*

Which is the BEST explanation of why Peter's Week 2 mean score was lower than his Week 1 mean score?

- A. Peter received the same score three times in week 1 *True*
- \* B. Peter had one very low score in week 2 - True ← outlier best explains situation*
- C. Peter did not beat his high score from week 1 in week 2 *True*
- D. Peter had one very high score in week 1 *True*

54) This histogram shows the frequency distribution of duration times for 107 consecutive eruptions of the Old Faithful geyser. The duration of an eruption is the length of time, in minutes, from the beginning of the spewing of water until it stops. What is the BEST description for this distribution?



- \* A. bimodal - means 2 high points*
- B. uniform - even ←*
- C. multiple outlier - don't appear to have outliers*
- D. skewed to the right - tail to the right*

55) This table shows admission prices for various museums in the same city.

Museum Prices				
\$9.00	\$12.00	\$9.75	\$8.25	\$11.25

$$\bar{x} = \frac{50.25}{5} = 10.05$$

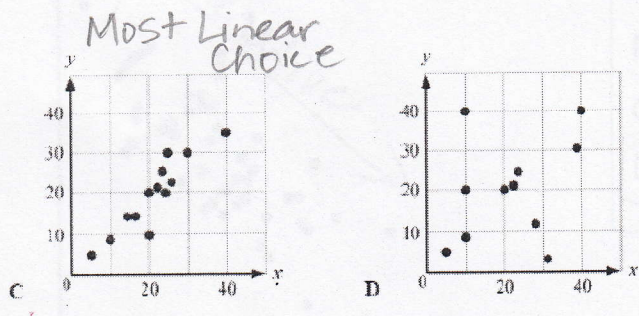
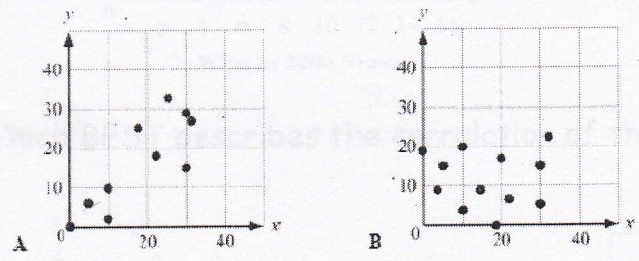
$$\bar{x} - x = 1.05 \quad 1.95 \quad 0.3 \quad 1.8 \quad 1.2$$

Which is the mean absolute deviation for this set of data? (MAD)

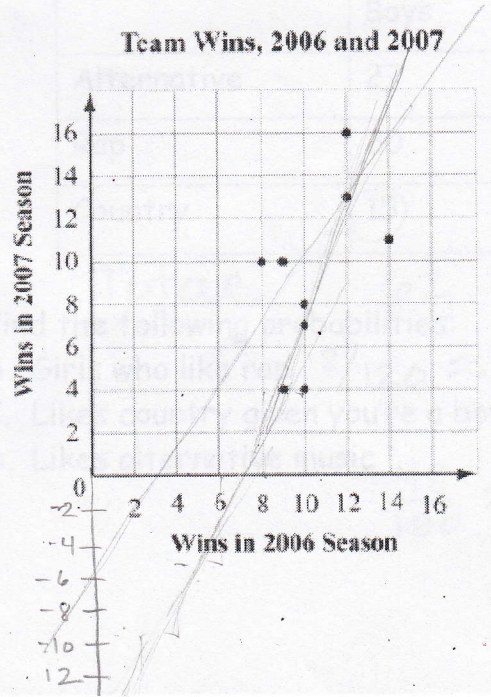
- \* A. \$1.26
- B. \$6.30
- C. \$10.05
- D. \$10.13

$$\frac{6.3}{5} = 1.26$$

56) Which graph most clearly displays a set of data for which a linear function is the model of best fit?



57) This graph plots the number of wins in the 2006 and 2007 seasons for a sample of professional football teams.

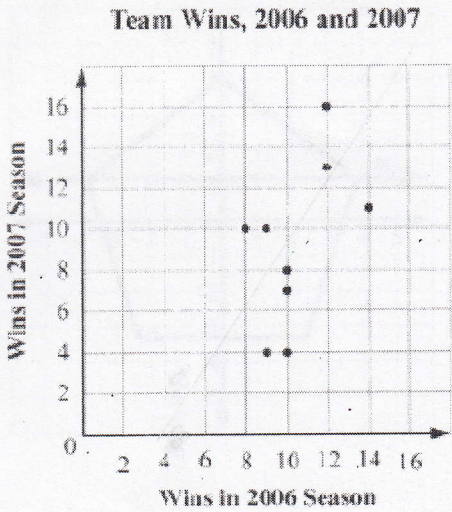


Which equation BEST represents a line that matches the trend of this data?

- A.  $y = \frac{1}{2}x$  doesn't appear to cross @ 0
- B.  $y = \frac{1}{2}x + 8$  doesn't have b of 8
- C.  $y = 2x - 6$
- \* D.  $y = 2x - 12$  This appears to be best choice

58) This graph plots the number of wins in the 2006 and 2007 seasons for a sample of professional football teams.

model:  $y = 1.1x - 2.29$

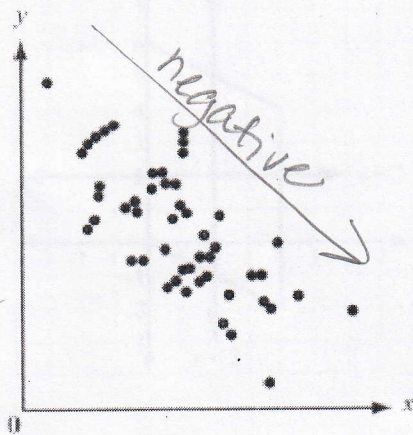


Based on the regression model, what is the predicted number of 2007 wins for a team that won 5 games in 2006?

- A. 0
- \*B. 3
- C. 8
- D. 10

$y = 1.1(5) - 2.29$   
 $= 3.21$

59) Which BEST describes the correlation of the two variables shown in the scatter plot?



- A. weak positive
- B. strong positive
- C. weak negative
- (D) strong negative

not positive  
 Weak has no linear quality

60) The following table shows a sample of the 9<sup>th</sup> graders at BHS and their favorite music.

	Boys	Girls	Total
Alternative	27	21	(48)
Rap	20	(8)	28
Country	(15)	29	44

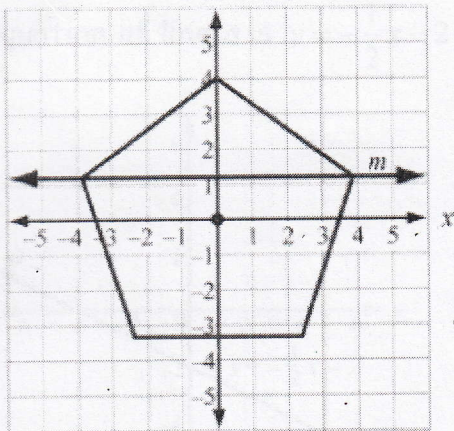
Total 62                      58                      120

Find the following probabilities:

- A. Girls who like rap  $\frac{8}{120} \approx 0.067$
- C. Likes country given you're a boy  $\frac{15}{62} \approx 0.24$
- D. Likes alternative music  $\frac{48}{120} \approx 0.4$

## Unit 5: Transformations in the Coordinate Plane

61) A regular pentagon is centered about the origin and has a vertex at (0, 4).



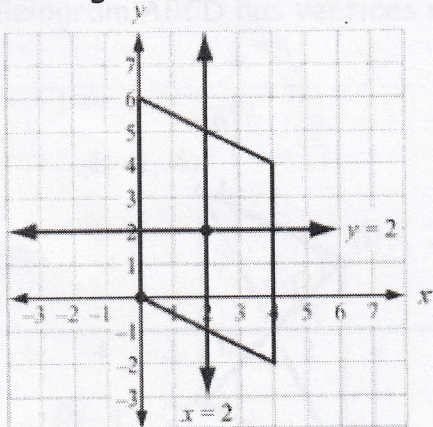
Which transformation maps the pentagon onto itself?

- A. a reflection across line m *no*
- B. a reflection across the x-axis *no - y axis yes*
- C. a clockwise rotation of  $100^\circ$  about the origin *no*
- \* D. a clockwise rotation of  $144^\circ$  about the origin

$$360 \div 5 = 72$$

*72, 144, 216, 288, 360  
would all map it onto itself*

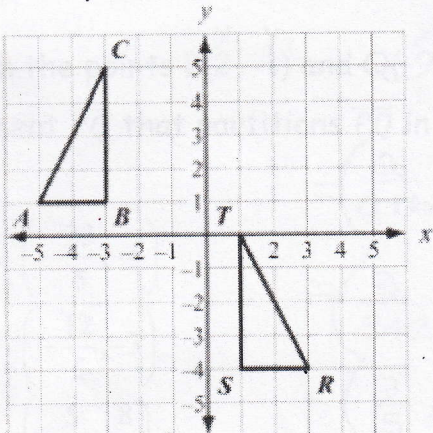
62) A parallelogram has vertices at (0, 0), (0, 6), (4, 4) and (4, -2).



Which transformation maps the parallelogram onto itself?

- A. a reflection across the line  $x = 2$  *no*
- B. a reflection across the line  $y = 2$  *no*
- \* C. a rotation of  $180^\circ$  about the point (2, 2) *yes*
- D. a rotation of  $180^\circ$  about the point (0, 0) *no*

63) Which sequence of transformations maps  $\triangle ABC$  to  $\triangle RST$ ?



A. Reflect  $\triangle ABC$  across the line  $x = -1$ . Then translate the result 1 unit down *No 5 down*

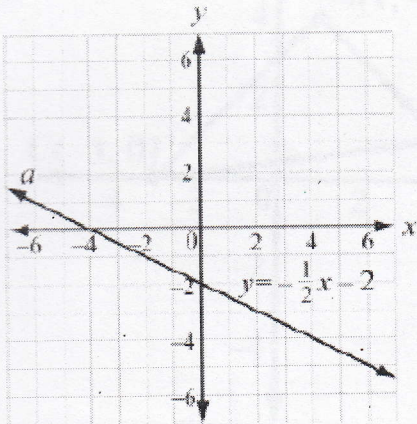
\* B. Reflect  $\triangle ABC$  across the line  $x = -1$ . Then translate the result 5 units down *YES*

C. Translate  $\triangle ABC$  6 units to the right. Then rotate the result  $90^\circ$  clockwise about the point (1, 1) *No rotating*

D. Translate  $\triangle ABC$  6 units to the right. Then rotate the result  $90^\circ$  counterclockwise about the point (1, 1) *No rotating*

# Unit 6: Connecting Algebra and Geometry Through Coordinates

64) An equation of line  $a$  is  $y = -\frac{1}{2}x - 2$



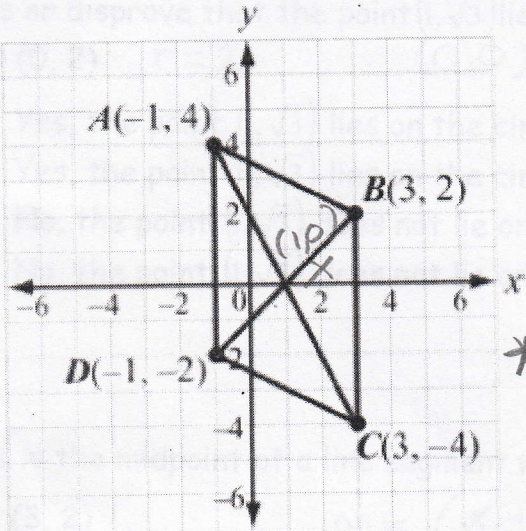
Which is an equation of the line that is perpendicular to line  $a$  and passes through the point  $(-4, 0)$ ?

- ~~A.  $y = -\frac{1}{2}x + 2$~~    
~~B.  $y = -\frac{1}{2}x + 8$~~    
 C.  $y = 2x - 2$    
 \* D.  $y = 2x + 8$
- $m = +2$    
 $(-4, 0)$    
 $y = mx + b$    
 $0 = 2(-4) + b$    
 $0 = -8 + b$    
 $+8 \quad +8$    


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 $8 = b$

65) Parallelogram ABCD has vertices as shown.



Which equation would be used to prove that the diagonals of parallelogram ABCD bisect each other?

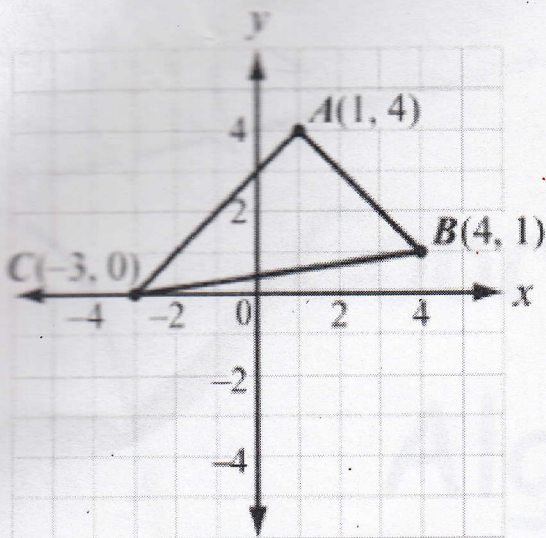
- $DX = BX$  and  $AX = CX$
- A.  $\sqrt{(3-1)^2 + (2-0)^2} = \sqrt{(1-3)^2 + (0+4)^2}$    
 B.  $\sqrt{(3+1)^2 + (2+0)^2} = \sqrt{(1+3)^2 + (0-4)^2}$    
 \* C.  $\sqrt{(-1-1)^2 + (4-0)^2} = \sqrt{(1-3)^2 + (0+4)^2}$    
 D.  $\sqrt{(-1+1)^2 + (4+0)^2} = \sqrt{(1+3)^2 + (0-4)^2}$

66) Given the points  $P(x_1, y_1)$  and  $Q(x_2, y_2)$ , what are the coordinates of the point on directed line segment  $\overline{PQ}$  that partitions  $\overline{PQ}$  in the ratio  $\frac{3-a}{2-b}$

- \* A.  $(-\frac{23}{5}, -4)$    
 B.  $(-\frac{12}{5}, -3)$    
 C.  $(-\frac{5}{3}, -\frac{8}{3})$    
 D.  $(-\frac{5}{3}, -\frac{8}{3})$

$$\begin{aligned}
 &= \left( \frac{a}{a+b} (x_2 - x_1) + x_1, \frac{a}{a+b} (y_2 - y_1) + y_1 \right) \\
 &= \left( \frac{3}{3+2} (-9 - 2) + 2, \frac{3}{3+2} (-6 + 11) - 1 \right) \\
 &= \left( \frac{3}{5} (-11) + 2, \frac{3}{5} (-5) - 1 \right) \\
 &= \left( -\frac{23}{5}, -4 \right)
 \end{aligned}$$

67) Triangle ABC has vertices as shown.



What is the area of the triangle?

- A.  $\sqrt{72}$  square units
- \* B. 12 square units
- C.  $\sqrt{288}$  square units
- D. 24 square units

$$A = \frac{1}{2} \cdot \sqrt{32} \cdot \sqrt{18}$$

$$= \frac{1}{2} \sqrt{32 \cdot 18}$$

$$= \frac{1}{2} \sqrt{576}$$

$$= \frac{1}{2} \cdot 24 = 12$$

$$AC = \sqrt{(-3-1)^2 + (0-4)^2} = \sqrt{(-4)^2 + (-4)^2} = \sqrt{16+16} = \sqrt{32}$$

$$AB = \sqrt{(1-4)^2 + (4-1)^2} = \sqrt{(-3)^2 + (3)^2} = \sqrt{9+9} = \sqrt{18}$$

68) Prove or disprove that the point  $(1, \sqrt{3})$  lies on the circle centered at the origin and containing the point  $(0, 2)$   $r=2$

$$(0,0) \quad (1, \sqrt{3}) \quad D = \sqrt{(0-1)^2 + (0-\sqrt{3})^2} = \sqrt{1^2 + (\sqrt{3})^2} = \sqrt{1+3} = \sqrt{2}$$

- A. Yes, the point  $(1, \sqrt{3})$  lies on the circle because the distance to the origin is 4  $r \neq 2$
- \* B. Yes, the point  $(1, \sqrt{3})$  lies on the circle because the distance to the origin is 2
- C. No, the point  $(1, \sqrt{3})$  does not lie on the circle because the distance to the origin is 3  $r \neq 3$
- D. No, the point  $(1, \sqrt{3})$  does not lie on the circle because the distance to the origin is 10  $r \neq 10$

69) What is the midpoint of a line segment with endpoints  $(-2, -4)$  and  $(2, 2)$ ?

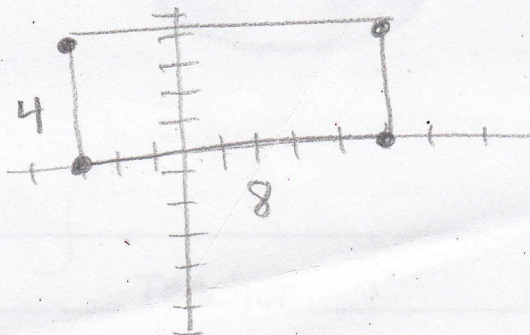
- A.  $(3, 2)$
- \* B.  $(0, -1)$
- C.  $(-1, 0)$
- D.  $(2, 3)$

$$m = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left( \frac{-2+2}{2}, \frac{-4+2}{2} \right) = (0, -1)$$

70) Find the area of rectangle ABCD with vertices  $A(-3, 0)$ ,  $B(-3, 4)$ ,  $C(5, 0)$ , and  $D(5, 4)$

- \* A. 32 units
- B. 24 units
- C. 16 units
- D. 64 units



$$A = 4 \cdot 8$$

$$= 32$$