Coordinate Algebra GA Milestone & Final Exam Study Guide

Name_____

Period_____ Teacher_____

Before the Test

- Start studying now. Set aside a little time each day to prepare yourself
- Review not only this study guide, but past tests, notes, & quizzes
- Take care of yourself!
  - Get a good night's sleep
  - Eat a good breakfast
  - Dress appropriately
  - Be on time for the test!

What to bring on test day

- Several pencils
- Scientific Calculator
- Positive attitude☺
- Be on time
- Don't be absent
- Bring your glasses, if needed (remember we take the Milestone on computer)

Test Taking Strategies

- Watch your time! There will be 73 questions divided into 2 sections. Remember you have 80 minutes to complete each section so don't spend too much time on one individual question.

- Stay focused on the test and avoid distractions
- Breathe, if you need a quick mental break, take it.
- Read each question in its entirety and examine all answer choices.
- Use process of elimination. Some answers may be eliminated quickly
- There may be questions you don't know- don't panic!
- Move on, and come back to them.
- Check your answers

Guide

Unit 1: Relationship Between Quantities

1) A rectangle has an area of 90 cm^2 and a width of 6 cm. Find the length of the rectangle.

    A. 540 cm

    B. 15 cm

    C. 150 cm

    D. 6 cm

2) A rectangle has a length of 12 m and a width of 400 cm. What is the perimeter of the rectangle?

    A. 824 cm

    B. 1600 cm

    C. 2000 cm

    D. 3200 cm

3) What is the area of a circle with a circumference of 43.98226 inches? Use 3.14159 for π.

    A. 153.44029 in^2

    B. 153.93791 in^2

    C. 153.9325 in^2

    D. 153.9394 in^2

4) The tension caused by a wave moving along a string is found using the formula $T = \dfrac{mv^2}{L}$. If m is the mass of the string in grams, L is the length of the string in centimeters, and v is the velocity of the wave in centimeters per second, what is the unit of the tension of the string, T?

    A. Gram-centimeters per second squared

    B. Centimeters per second squared

    C. Grams per centimeter-second squared

    D. Centimeters squared per second

5) The distance a car travels can be found using the formula d = rt, where d is the distance, r is the rate of speed, and t is time. How many miles does the car travel, if it drives at a speed of 70 miles per hour for $\frac{1}{2}$ hour?

    A. 35 miles

    B. 70 miles

    C. 105 miles

    D. 140 miles

6) A certain population of bacteria has an average growth rate of 0.02 bacteria per hour. The formula for the growth of the bacteria's population is $A = P_0(2.71828)^{0.02t}$

    A. 7

    B. 272

    C. 1478

    D. 20000

> If you begin with 200 bacteria, about how many bacteria will there be after 100 hours?

7) The sum of the angle measures in a triangle is 180°. Two angles of a triangle measure 20° and 50°. What is the measure of the third angle?

    A. 30°
    B. 70°
    C. 110°
    D. 160°

8) Which equation shows $P = 2l + 2w$ when solved for w?

    A. $w = \dfrac{2l}{P}$

    B. $w = \dfrac{2l - P}{2}$

    C. $w = 2l - \dfrac{P}{2}$

    D. $w = \dfrac{P - 2l}{2}$

9) Bruce owns a business that produces widgets. He must bring in more in revenue than he pays out in costs in order to turn a profit.

- It costs $10 in labor and materials to make each of his widgets
- His rent each month for his factory is $4000
- He sells each widget for $25

How many widgets does Bruce need to sell each month to make a profit?

    A. 160
    B. 260
    C. 267
    D. 400

10) Convert 5 miles to feet

    A. 1500 ft
    B. 26400 ft
    C. 25000 ft
    D. 60 ft

11) An amount of $1000 is deposited into a bank account that pays 4% annual interest. If there are no other withdrawals or deposits, what will be the balance of the account after 3 years?

    A. $1000
    B. $2744
    C. $884.75
    D. $1124.86

12) The angles of a certain triangle measure $x°$, $2x°$, and $6x°$. Solve for x.

    A. 20   C. 5
    B. 10   D. 15

Unit 2: Reasoning with Equations and Inequalities

13) Which equation shows ax – w = 3 solved for w?

    A. w = ax – 3

    B. w = ax + 3

    C. w = 3 – ax

    D. w = 3 + ax

14) Which equation is equivalent to $\dfrac{7x}{4} - \dfrac{3x}{8} = 11$?

    A. 17x = 88

    B. 11x = 88

    C. 4x = 44

    D. 2x = 44

15) Which equation shows 4n = 2(t – 3) solved for t?

    A. $t = \dfrac{4n - 2}{3}$

    B. $t = \dfrac{4n - 3}{2}$

    C. $t = \dfrac{4n + 6}{2}$

    D. $t = 4n - 3$

16) Which equation shows 6(x + 4) = 2(y + 5) solved for y?

    A. y = x + 3

    B. y = x + 5

    C. y = 3x + 7

    D. y = 3x + 17

17) This equation can be used to find h, the number of hours it takes Flo and Bryan to mow their lawn:

$$\frac{h}{3} + \frac{h}{6} = 1$$

How many hours will it take them to mow their lawn?

    A. 6   C. 2

    B. 3   D. 1

18) For what values of x is the inequality $\dfrac{2}{3} + \dfrac{x}{3} > 1$ true?

    A. x < 1

    B. x > 1

    C. x < 5

    D. x > 5

19) A ferry boat carries passengers back and forth between two communities on the Peachville River.

- It takes 30 minutes longer for the ferry to make the trip upstream than downstream.
- The ferry's average speed in still water is 15 mph
- The river's current is usually 5 mph

This equation can be used to determine how many miles apart the two communities are:

$$\frac{m}{15-5} = \frac{m}{15+5} + 0.5$$

What is m, the distance between the two communities?

A. 0.5 miles
B. 5 miles
C. 10 miles
D. 15 miles

20) A manager is comparing the cost of buying ball caps with the company emblem from two different companies.

- Company X charges a $50 fee plus $7 per cap
- Company Y charges a $30 fee plus $9 per cap

For what number of ball caps will the manager's cost be the same for both companies?

A. 10 caps
B. 20 caps
C. 40 caps
D. 100 caps

21) A shop sells one-pound bags of peanuts for $2 and three-pound bags of peanuts for $5. If 9 bags are purchased for a total cost of $36, how many three-pound bags were purchased?
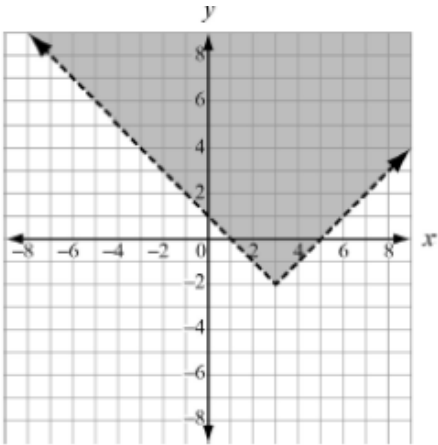
A. 3
B. 6
C. 9
D. 18

22) Which graph represents the solution to x > 3?

A.

-1 0 1 2 3 4 5 6 7

B.

-1 0 1 2 3 4 5 6 7

C.

-1 0 1 2 3 4 5 6 7

D.

-1 0 1 2 3 4 5 6 7
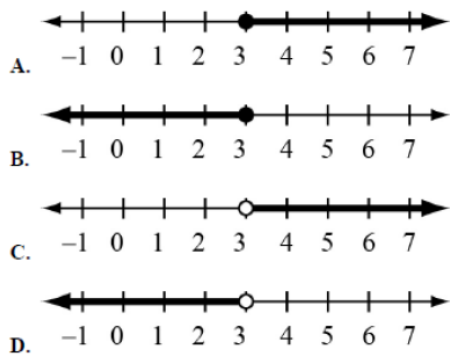
23) Which graph represents a system of linear equations that has multiple common coordinate pairs?

A

B

C

D
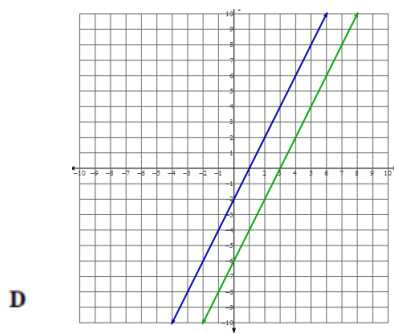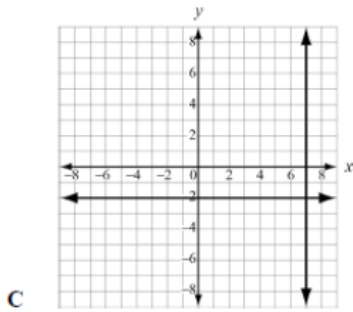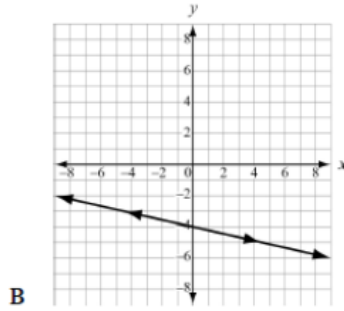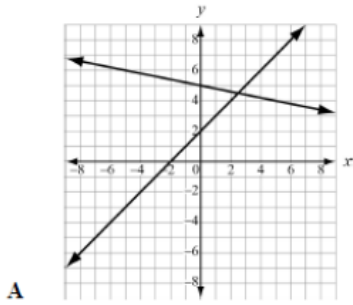
24) Which pair of inequalities is shown in the graph?

A. $y > -x+1$ and $y > x-5$

B. $y > x+1$ and $y > x-5$

C. $y > -x+1$ and $y > -x-5$

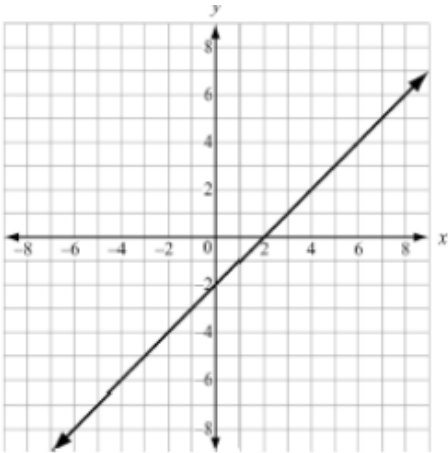D. $y > x+1$ and $y > -x-5$

25) Solve the inequality $7-4x \geq 3$?

A. $x \leq 1$
B. $x \geq 1$
C. $x \leq -1$
D. $x \geq -1$

26) Solve this system of equations. $\begin{cases} 2x - y = 1 \\ 5 - 3x = -y \end{cases}$
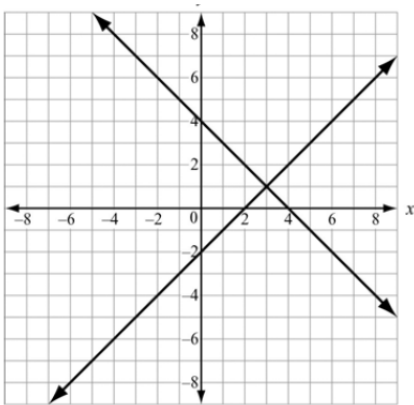
A. (-4, -7)
B. (4, -6)
C. (-4, 8)
D. (4, 7)

Unit 3: Linear and Exponential Functions

27) Which equation corresponds to the graph below?
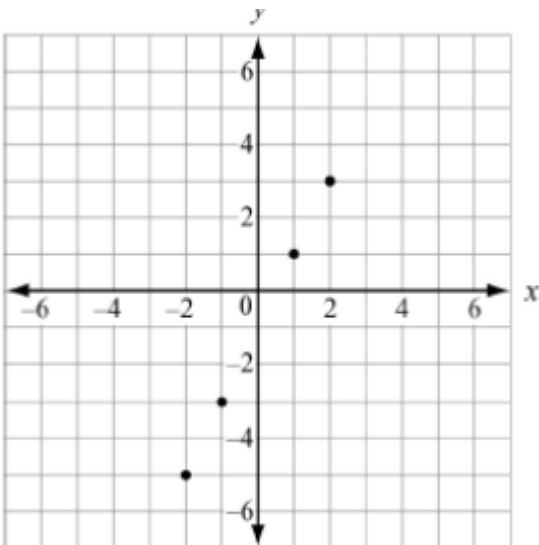

A. $y = x + 1$

B. $y = 2x + 1$

C. $y = x - 2$

D. $y = 3x - 1$

28) Two lines are graphed on this coordinate plane. Which point appears to be a solution of both lines?

A. $(0, -2)$

B. $(0, 4)$

C. $(2, 0)$

D. $(3, 1)$

29) Which equation corresponds to the points in the coordinate plane?

A. $y = 2x - 1$

B. $y = x - 3$

C. $y = x - 1$

D. $y = x + 1$

30) Based on the tables, at what point do the lines y = -x + 5 and y = 2x – 1 intersect?

$y = -x + 5$	
x	y
-1	6
0	5
1	4
2	3
3	2

$y = 2x - 1$	
x	y
-1	-3
0	-1
1	1
2	3
3	5

A. (1, 1)

B. (3, 5)

C. (2, 3)

D. (3, 2)

31) The first term in this sequence is -1.

n	1	2	3	4	5	. . .
a_n	-1	1	3	5	7	. . .

Which function represents the sequence?

A. $a_n = a_{n-1} + 1$

B. $a_n = a_{n-1} + 2$

C. $a_n = 2a_{n-1} - 1$

D. $a_n = 2a_{n-1} - 3$

32) Which function is modeled in this table?

x	$f(x)$
1	8
2	11
3	14
4	17

A. f(x) = x + 7

B. f(x) = x + 9

C. f(x) = 2x + 5

D. f(x) = 3x + 5

33) Which explicit formula describes the pattern in this table?

d	C
2	6.28
3	9.42
5	15.70
10	31.40

A. d = 3.14 + C

B. 3.14 x C = d

C. 31.4 x 10 = C

D. C = 3.14 x d

34) If f(12) = 4(12) – 20, which function gives f(x)?

    A. f(x) = 4x
    B. f(x) = 12
    C. f(x) = 4x – 20
    D. f(x) = 12x – 20

35) A farmer owns a horse that can continuously run an average of 8 miles an hour for up to 6 hours. Let y be the distance the horse can travel for a given x amount of time in hours. The horse's progress can be modeled by a function.

   Which of the following describes for domain of the function?

    A. $0 \le x \le 6$
    B. $0 \le y \le 6$
    C. $0 \le x \le 48$
    D. $0 \le y \le 48$

36) A population of squirrels doubles every year. Initially there were 5 squirrels. A biologist studying the squirrels created a function to model their population growth. $P(t) = 5(2^t)$ where t is time. The graph of the function is shown. What is the range of the function?
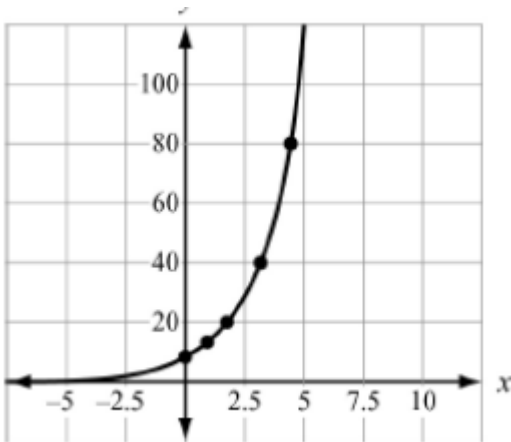
A. any real number

B. any whole number greater than 0

C. any whole number greater than 5

D. any whole number greater than or equal to 5

37) The function graphed on this coordinate grid shows f(x), the height of a dropped ball in feet after its xth bounce.
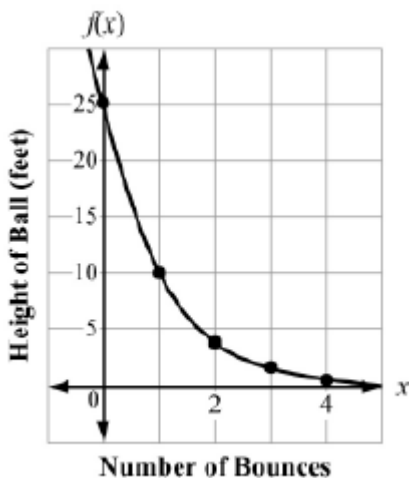
On which bounce was the height of the ball 10 ft?

A. bounce 1

B. bounce 2

C. bounce 3

D. bounce 4

38) Juan and Patti decided to see who could read the most books in a month. They began to keep track after Patti had already read 5 books that month. This graph shows the number of books Patti read for the next 10 days.

Number of Books Read
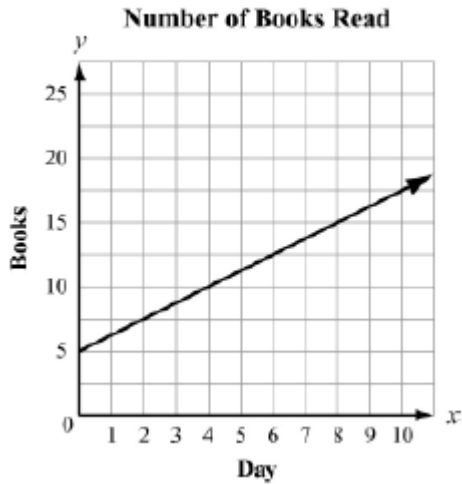
If Juan has read no books before the fourth day of the month and he reads at the same rate as Patti, how many books will he have read by day 12?

A. 5

B. 10

C. 15

D. 20

39) To rent a canoe, the cost is $3 for the oars and life preserver, plus $5 an hour for the canoe. Which graph models the cost of renting a canoe?

A

B

C

D
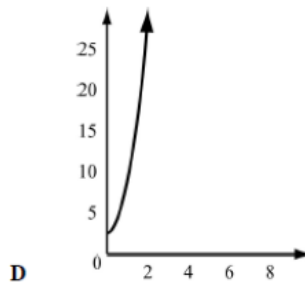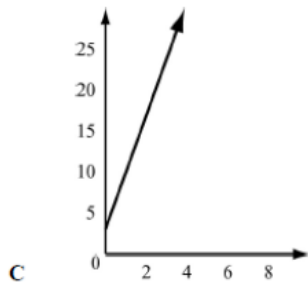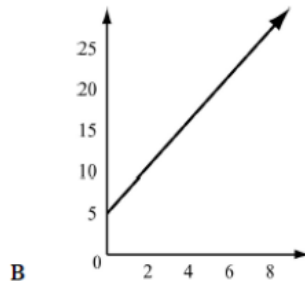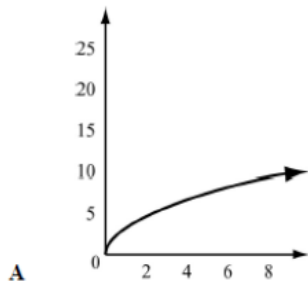
40) Which function represents this sequence?

n	1	2	3	4	5	...
a_n	6	18	54	162	486	...

A. $f(n) = 3^{n-1}$

B. $f(n) = 6^{n-1}$

C. $f(n) = 3(6^{n-1})$

D. $f(n) = 6(3^{n-1})$

41) The first term of the sequence is 3. Which function represents the sequence?

n	1	2	3	4	5	. . .
a_n	3	10	17	24	31	. . .

    A. $f(n) = n + 3$
    B. $f(n) = 7n - 4$
    C. $f(n) = 3n + 7$
    D. $f(n) = n + 7$

42) The points (0, 1), (1, 5), (2, 25), (3, 125) are on the graph of a function. Which equation represents that function?

    A. $f(x) = 2^x$
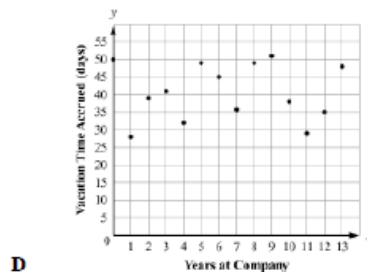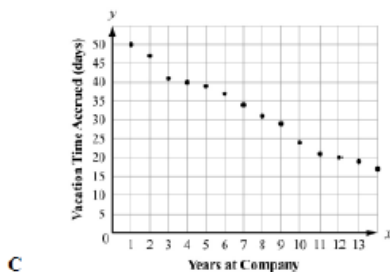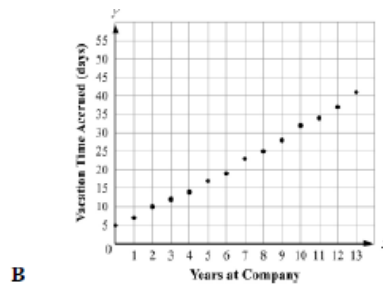   B. $f(x) = 3^x$
    C. $f(x) = 4^x$
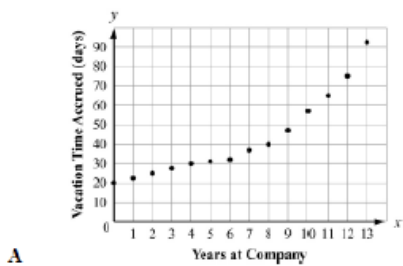   D. $f(x) = 5^x$

43) A function g is an odd function. If g(-3) = 4, which other point lies on the graph of g?

    A. (3, -4)
    B. (-3, -4)
    C. (4, -3)
    D. (-4, 3)

44) Which statement is true about the function f(x) = 7?

    A. The function is odd because –f(x) = f(-x)
    B. The function is even because –f(x) = f(-x)
    C. The function is odd because f(x) = f(-x)
    D. The function is even because f(x) = f(-x)

45) Which scatter plot BEST represents a model of linear growth?

46) Which scatter plot BEST represents a model of exponential growth?

A   Years Since 2000

B   Years Since 2000

C   Years Since 2000

D   Years Since 2000
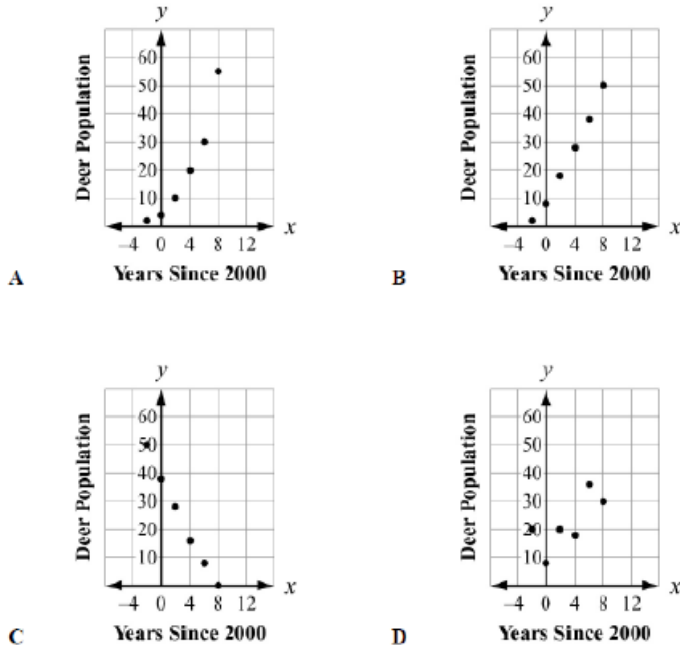
47) Which table represents an exponential function?

A.

x	0	1	2	3	4
y	5	6	7	8	9

B.

x	0	1	2	3	4
y	0	22	44	66	88

C.

x	0	1	2	3	4
y	5	13	21	29	37

D.

x	0	1	2	3	4
y	0	3	9	27	81

48) If the parent function is f(x) = mx + b, what is the value of the parameter *m* for the line passing through the points (-2, 7) and (4, 3)?

A. 9

B. $-\dfrac{3}{2}$

C. -2

D. $-\dfrac{2}{3}$

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

Which conclusion can be drawn from the data?

A. The interquartile range of the temperatures is the same for both cities
B. The lower quartile for the temperatures in Macon is lower than the lower quartile for the temperatures in Charlotte
C. The mean and median temperatures of Macon were higher than the mean and median temperatures of Charlotte
D. The upper quartile for the temperatures in Charlotte was lower than the upper quartile for the temperatures in Macon

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

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

A. 4 to 14
B. 6 to 14
C. 10 to 16
D. 12 to 15

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
B. The lower quartile is 44
C. The median is 45
D. The maximum is 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.
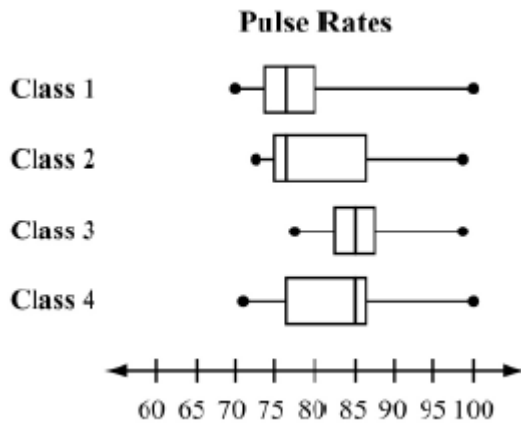
Pulse Rates

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

A. Class 1

B. Class 2

C. Class 3

D. Class 4

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

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
B. Peter had one very low score in week 2
C. Peter did not beat his high score from week 1 in week 2
D. Peter had one very high score in week 1

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?
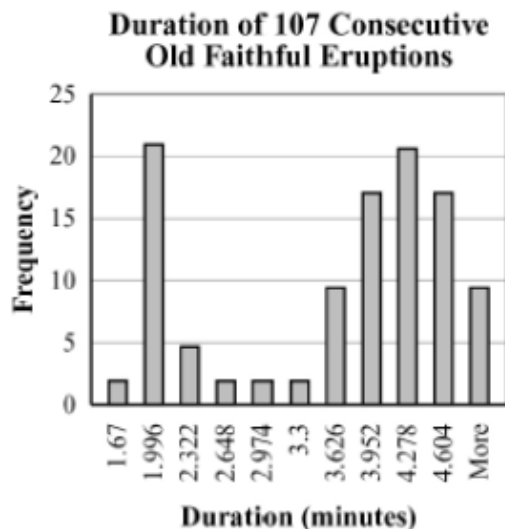
A. bimodal

B. uniform
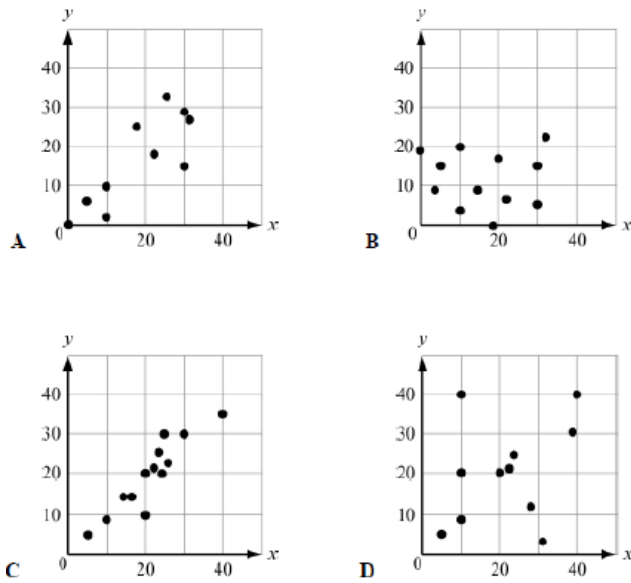
C. multiple outlier

D. skewed 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

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

A. $1.26
B. $6.30
C. $10.05
D. $10.13

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.

Team Wins, 2006 and 2007

Wins in 2007 Season

Wins in 2006 Season
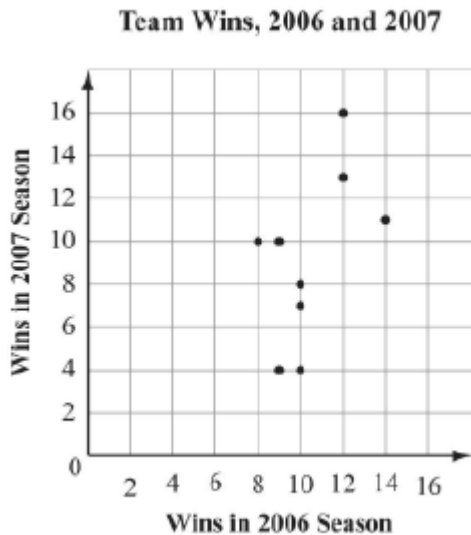
Which equation BEST represents a line that matches the trend of this data?

A. $y = \dfrac{1}{2}x$

B. $y = \dfrac{1}{2}x + 8$

C. $y = 2x - 6$

D. $y = 2x - 12$

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

Team Wins, 2006 and 2007
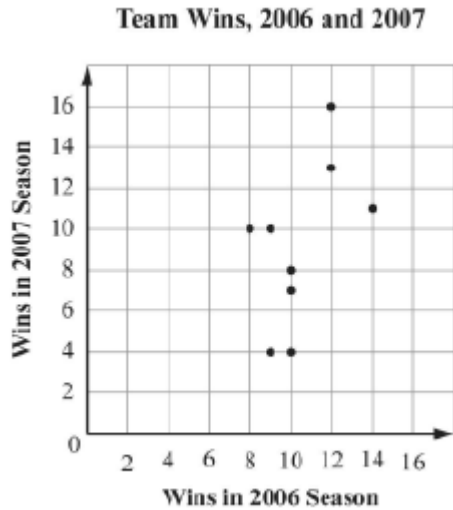
Based on the regression model,

y = 1.1x -2.29, 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

59) Which BEST describes the correlation of the two variables shown in the scatter plot?
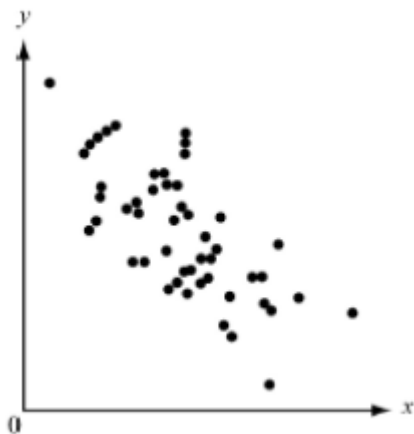
A. weak positive

B. strong positive

C. weak negative

D. strong negative

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

	Boys	Girls
Alternative	27	21
Rap	20	8
Country	15	29

Find the following probabilities:
A. Girls who like rap
B. Given you like country, you are a girl
C. Likes country given you're a boy
D. Likes alternative music

Unit 5: Transformations in the Coordinate Plane

61) A regular pentagon is centered about the origin and has a vertex at (0, 4).
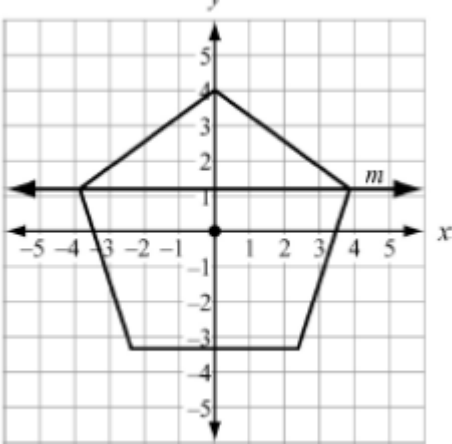
Which transformation maps the pentagon onto itself?

A. a reflection across line m

B. a reflection across the x-axis

C. a clockwise rotation of $100°$ about the origin
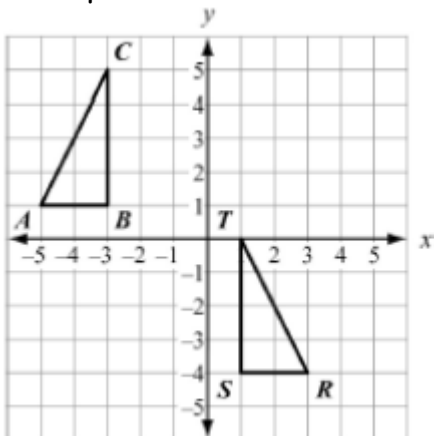
D. a clockwise rotation of $144°$ about the origin

62) A parallelogram has vertices at (0, 0), (0, 6), (4, 4) and (4, -2).
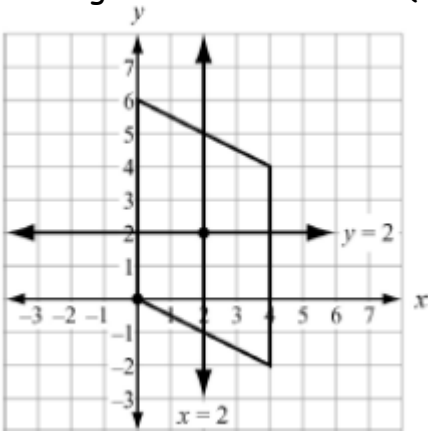
Which transformation maps the parallelogram onto itself?

A. a reflection across the line x = 2

B. a reflection across the line y = 2

C. a rotation of $180°$ about the point (2, 2)

D. a rotation of $180°$ about the point (0, 0)

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

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

C. Translate $\triangle ABC$ 6 units to the right. Then rotate the result $90°$ clockwise about the point (1, 1)

D. Translate $\triangle ABC$ 6 units to the right. Then rotate the result $90°$ counterclockwise about the point (1, 1)

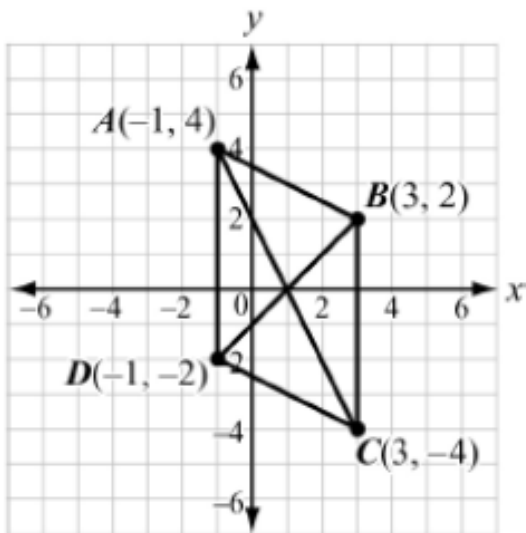# Unit 6: Connecting Algebra and Geometry Through Coordinates

64) An equation of line a is $y = -\frac{1}{2}x - 2$
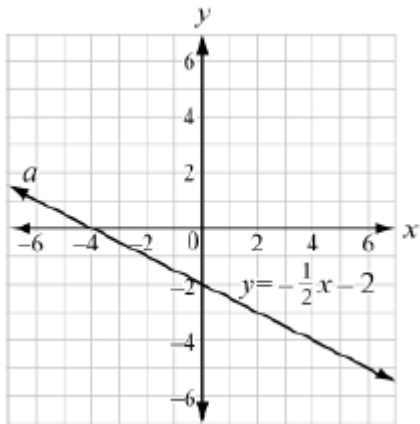
Which is an equation of the line that is perpendicular to line a and passes through the point (-4, 0)?

A. $y = -\frac{1}{2}x + 2$

B. $y = -\frac{1}{2}x + 8$

C. $y = 2x - 2$

D. $y = 2x + 8$

65) Parallelogram ABCD has vertices as shown.

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

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(2, -1) and Q(-9, -6), what are the coordinates of the point on directed line segment $\overline{PQ}$ that partitions $\overline{PQ}$ in the ratio $\frac{3}{2}$?

A. $\left(-\frac{23}{5}, -4\right)$

B. $\left(-\frac{12}{5}, -3\right)$

C. $\left(-\frac{5}{3}, -\frac{8}{3}\right)$

D. $\left(-\frac{5}{3}, -\frac{8}{3}\right)$

67) Triangle ABC has vertices as shown.

$C(-3, 0)$

$A(1, 4)$

$B(4, 1)$
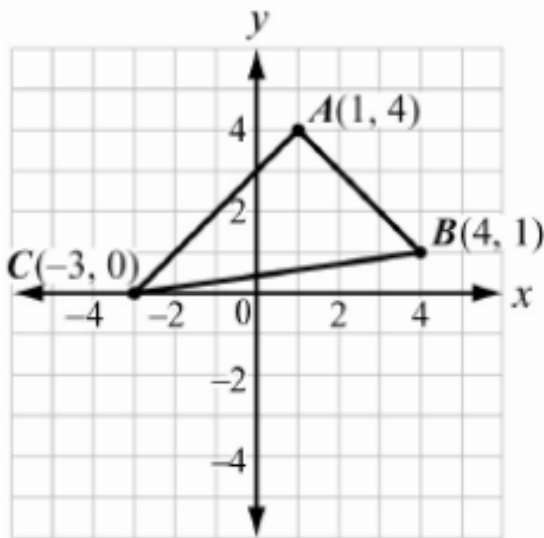
What is the area of the triangle?

A. $\sqrt{72}$ square units

B. 12 square units

C. $\sqrt{288}$ square units

D. 24 square units

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

    A. Yes, the point $(1, \sqrt{3})$ lies on the circle because the distance to the origin is 4
    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
    D. No, the point $(1, \sqrt{3})$ does not lie on the circle because the distance to the origin is 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)

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