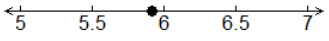
Name _____

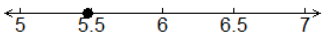
8th grade math Semester 1 Exam Review

1.Which number line shows the approximation of $\sqrt{35}$? (8.2B)

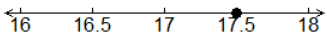
A



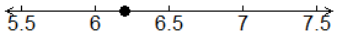
B



C



D



2.The population of a South American country is about 17,400,000. Which expression shows this number in scientific notation?

A 1.7×10^7 C 1.8×10^7

B 1.74×10^7 D 17.4×10^6

For numbers 3-5 express the numbers in scientific notation.

3. 5,600,000
4. 0.00000043
5. 3,400

6. Express the following number in standard notation.

4.7×10^5 = _____

7. A small square garden has an area of 25 square yards. How long is each side of the garden?

A 2 yards

B 2.5 yards

C 5 yards

D 5.2 yards

8. Write the numbers in order from least to greatest.

$$4\pi,\ \sqrt{150},\ 12\frac{3}{8}$$

9. Arrange the numbers in order from greatest to least.

$$6.\overline{3},\ 2\pi,\ \sqrt{40},\ \frac{32}{5}$$

10. Which set of numbers is ordered from least to greatest?

a. $6\frac{1}{9},\ \sqrt{37},\ 6\frac{1}{2},\ \sqrt{29}$

b. $\sqrt{5},\ 2\frac{3}{5},\ \sqrt{7},\ 3$

c. $-10,\ \sqrt{16},\ -3\frac{1}{4},\ \sqrt{20}$

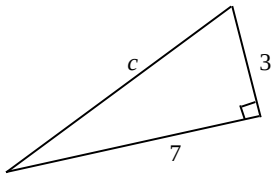
d. $\sqrt{11},\ 4,\ 3\frac{1}{3},\ \sqrt{17}$

11. Matthew builds toy cars for a hobby. He wants to organize his tires by circumference size from least to greatest. The tire sizes, in cm, are (**8.2D**):

$$3\pi \text{ cm},\ 9\frac{3}{4} \text{ cm},\ 9.6 \text{ cm},\ \frac{28}{3} \text{ cm}$$

Answer: _____

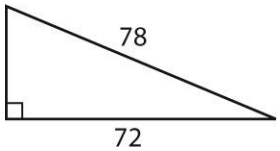
12. Find the length of the hypotenuse. Round your answer to the nearest hundredth.



a. 9.49 c. 7.62

b. 3.16 d. 10.00

13. What is the length of the third side of the triangle below?



Name _____

14. A park in the shape of a rectangle has side lengths of 7 miles and 9 miles. Approximately how much shorter is the walk diagonally across the park than along the two sides of the park? (Draw a picture!)

15. Which set of three numbers can be used to make a right triangle?

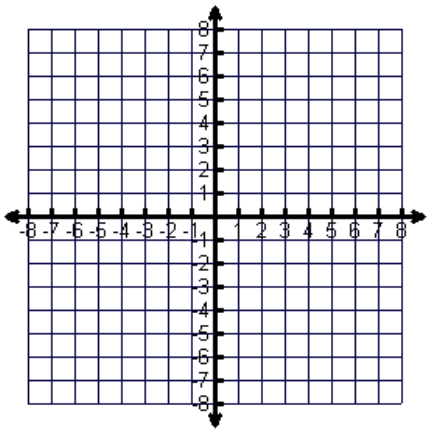
A 39, 41, 45

B 39, 49, 59

C 39, 69, 99

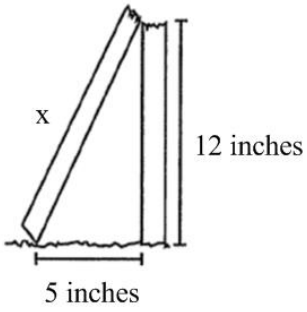
D 39, 80, 89

16. Point M is located at (4, 6) on a coordinate grid. Point M is translated 8 units to the left and 9 units down to create point M′. Which measurement is closest to the distance between point M and point M′ in units? (8.7D)



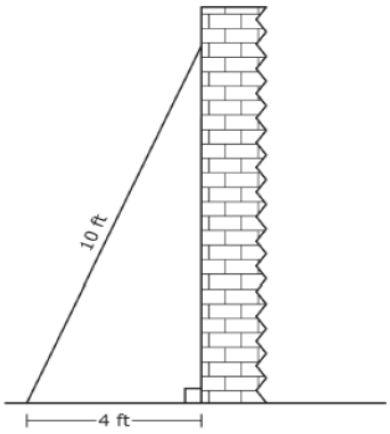
17.Courtney's soccer coach is having the team run drills to warm up before their game. The coach instructed the team to run from one corner of the soccer field to the corner diagonally across from them. If a soccer field measures 90 meters wide and 120 meters long, how far will Courtney run if she runs the drill three times? (8.7C) (Draw a picture!)

18. A wooden post was stuck by lightning and split into two pieces as shown in the diagram below. What was the *original* height of the wooden post? (**8.7C**)



Original height: _____

19. 10-foot ladder is leaning against a wall. The bottom of the ladder is 4 feet from the base of the wall, as shown below.



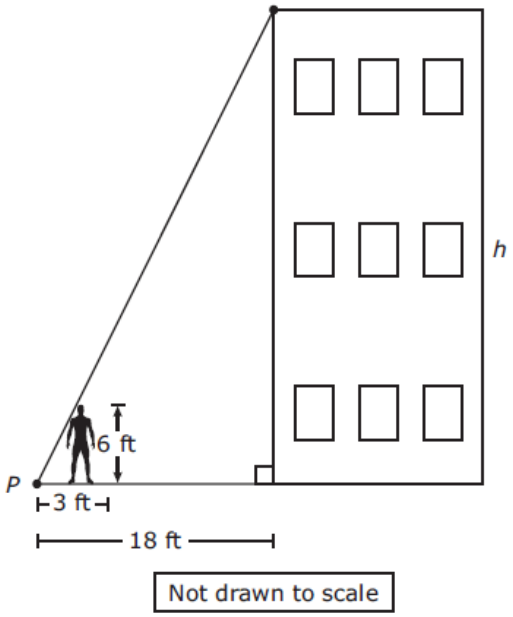
Which of the following is closest to the distance from the top of the ladder to the base of the wall? (**8.7C**)

20. A square has a perimeter of 48 centimeters. The square is dilated by a factor of 1.5. What is the length of each side of the new square?

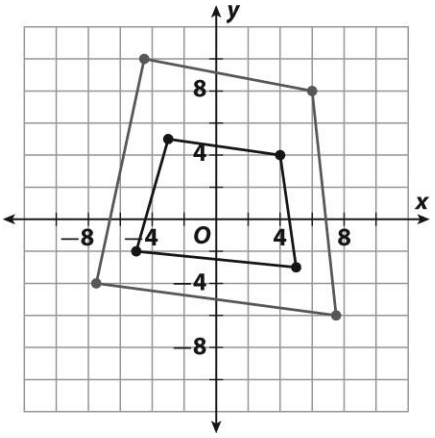
Answer _____

Name _____

21. In the diagram a person who is 6ft tall is standing on the ground 3ft away from point P. A line segment drawn from the top corner of the building to point P creates similar triangles. What is the height of the bulding.



22. The gray figure (the larger one) below is the image of the black figure after a dilation. Which represents the dilation?



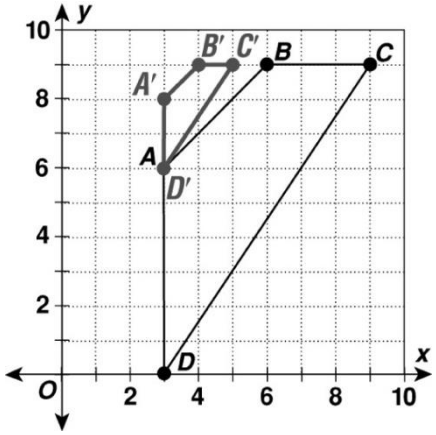
A $(x, y) \rightarrow (2x, 2y)$

B $(x, y) \rightarrow (.75x, .75y)$

C $(x, y) \rightarrow (.5x, .5y)$

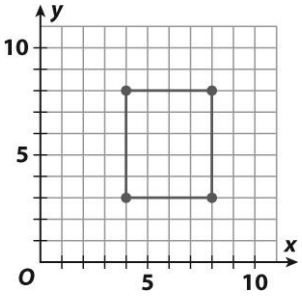
D $(x, y) \rightarrow (1.5x, 1.5y)$

23. Do the figures below show a dilation? If so, is it an enlargement or a reduction? What is the scale factor?



24. Graph the image of the figure after a dilation with the origin as its center and a scale factor of $\frac{1}{2}$. Draw your answer on the same grid.

Then write an algebraic rule to describe the dilation.



25. A triangle has vertices at *A* (-6, -3), *B* (1, 5), and *C* (4, -4). The triangle is dilated according to the transformation below. The center of dilation is the origin.

$(x, y) \rightarrow (2.5x, 2.5y)$

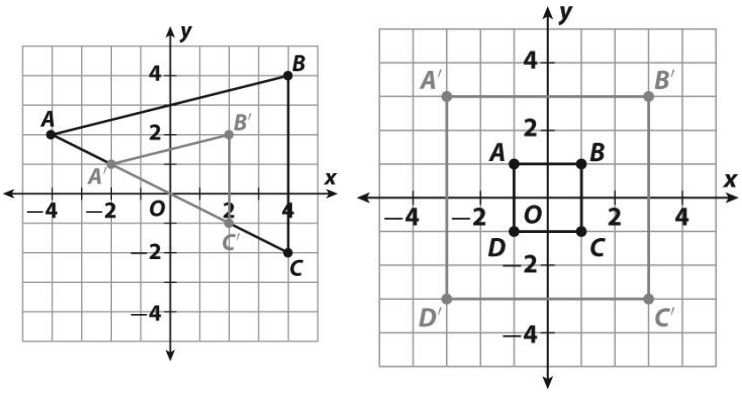
What are the vertices of the image of the triangle?

A' _____ B' _____ C' _____

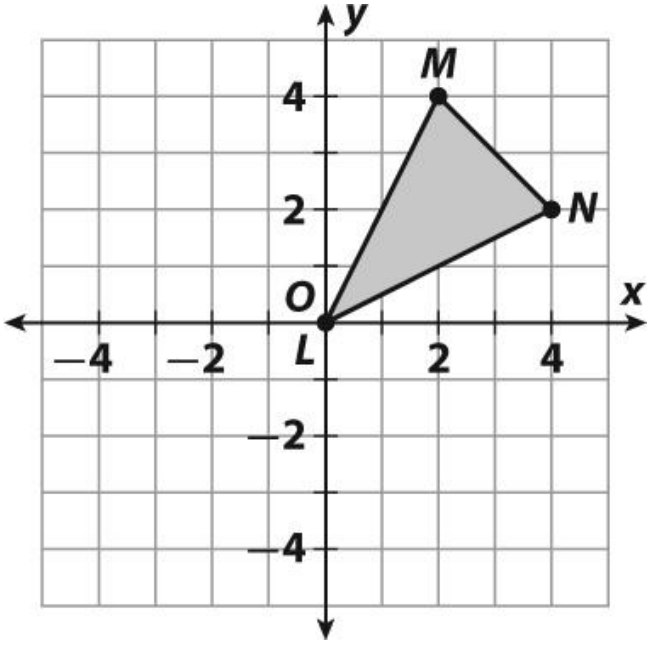
Name _____

26. Tell whether each dilation is an enlargement or a reduction. Then write the algebraic representation used to dilate the pre-image to the image.

1._____ 2._____

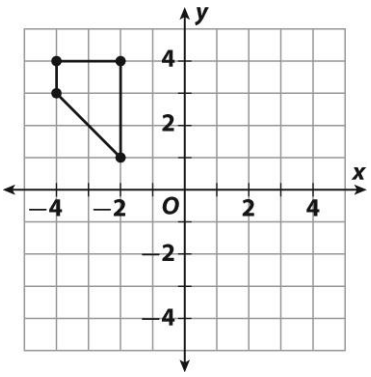


Use the grid for 27-29. Draw your answers on the grid and label each one with the problem number.



27. Reflect Δ*LMN* across the *y*-axis.
28. Rotate Δ*LMN* 90° clockwise about the origin.
29. Rotate Δ*LMN* 180° about the origin.

Use the grid to answer questions 30- 32



30. The quadrilateral shown is translated 7 units to the right and 5 units down. In which quadrant is the image of the quadrilateral located?

A I C III

B II D IV

31. The quadrilateral shown is reflected across the *y*-axis. In which quadrant is the image of the quadrilateral located?

A I C III

B II D IV

32. The quadrilateral shown is rotated 90° clockwise about the origin. In which quadrant is the image of the quadrilateral located?

A I C III

B II D IV

33. A transformation is applied to a figure to create a new figure. Which transformation does not preserve congruence?

A) A reflection across the x-axis

B) A dilation by a scale factor of 5

C) A rotation of 90° clockwise.

34. Which representation of a transformation on a coordinate grid does not preserve congruence?

A. (x,y) → (x+4, y+4)

B (x, y) → $(\frac{1}{3}x, \frac{1}{3}y)$

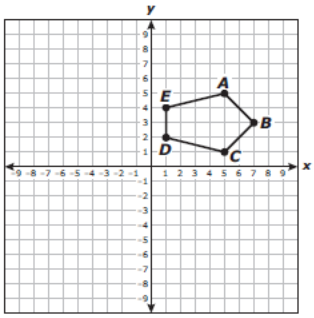
C. (x,y) → (x, -y)

D (x, y) → (-x, y)

Name _____

35.

Pentagon *ABCDE* is rotated 180° clockwise about the origin to form pentagon *A′B′C′D′E′*.



Which statement is true?

A Pentagon *ABCDE* is congruent to pentagon *A′B′C′D′E′*.

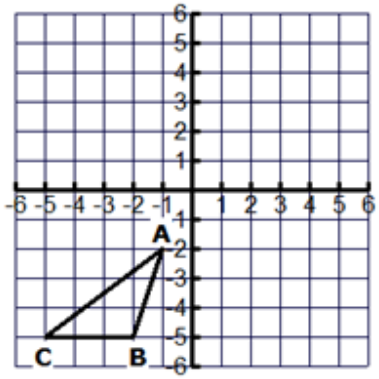
B The sum of the angle measures of pentagon *A′B′C′D′E′* is 180° more than the sum of the angle measures of pentagon *ABCDE*.

C Each side length of pentagon *A′B′C′D′E′* is 2 times the corresponding side length of pentagon *ABCDE*.

D Each side length of pentagon *A′B′C′D′E′* is $\frac{1}{2}$ the corresponding side length of pentagon *ABCDE*.

36. Transform ΔABC using $(x, y) \rightarrow (x, -y)$.

Which points represent the image, $\Delta A'B'C'$?



A'_____ B'_____ C'_____

37. Triangle ABC was translated 5 units to the right and 8 units down. Which rule describes the translation that was applied to triangle ABC to create triangle A′B′C′?

A (x, y) → (x + 5, y - 8)

B (x, y) → (x + 8, y - 5)

C (x, y) → (8x, -5y)

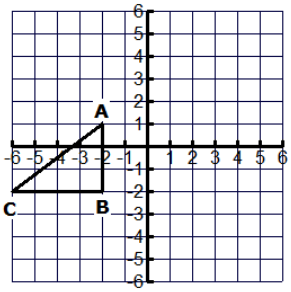
D (x, y) → (-8x, 5y)

38. What are the coordinates of the image of the point (7, 9) after a 90° counter-clockwise rotation? (8.10C)

a. (7, 9) b. (-7, -9) c. (9, -7) d. (-9, 7)

39. Reflect the image of ΔABC using $(x, y) \rightarrow (-x, y)$

What is the length of the image of side A'C'?



40. A triangle has coordinates $A(-2, -1)$, $B(-1, 2)$, and $C(1, -2)$. If the triangle is reflected across the ***y*-axis**, what are the new coordinates of the triangle? (8.10C)

41.The table gives the vertices of a pre-image and its image. Which algebraic rule represents this transformation? (8.10C)

Pre-image	**Image**
$(3, -5)$	$(2, -8)$
$(5, 1)$	$(4, -2)$
$(1, 3)$	$(0, 0)$
$(-1, -1)$	$(-2, -4)$
$(-1, -4)$	$(-2, -7)$

Name _____

2nd Nine Weeks.

Use the description below for Exercises 42-44

A rectangle has a length of 12 inches, a width of 9 inches, and a perimeter of 42 inches.

42. The rectangle is dilated using a scale of 4. Find the perimeter and the area of the dilated rectangle.

perimeter: _____
area: _____

43. What rule can you use to show the relationship of the old perimeter to the new perimeter?

44. What rule can you use to show the relationship of the old area to the new area?

45. A elementary school has a rectangular field and a rectangular playground that are similar in shape. Each dimension of the field is 4.5 times the corresponding dimension of the playground. Which statement is true? (8.10D)

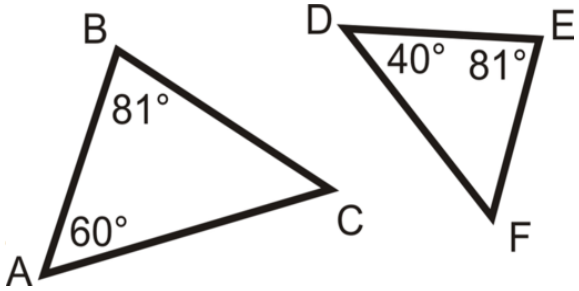
a. The area of the field is 4.5 times the area of the playground.

b. The area of the field is 20.25 times the area of the playground.

c. The perimeter of the field is 9 times the perimeter of the playground.

46. Which pair of triangles are similar? Circle either 1 or 2

1.



For questions 47- 52 find the slope of the line that passes through each pair of points.

47. (2, 4) and (9, 12)

48. (5, 9) and (7, 9)

49. (3, 3) and (6, -7)

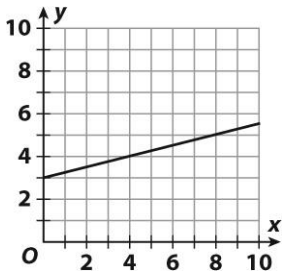
50. (5,7) and (7, 15)

51. (5, 10) and (5, 12)

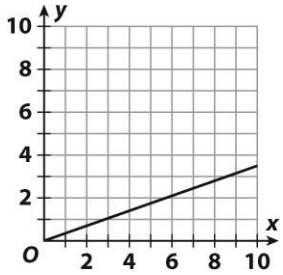
52. (11, 16) and (14, 20)

For questions 53-56, write if the relationship is proportional or non-proportional and EXPLAIN HOW YOU KNOW.

53.



54.



55. $t = 15d - 56$.

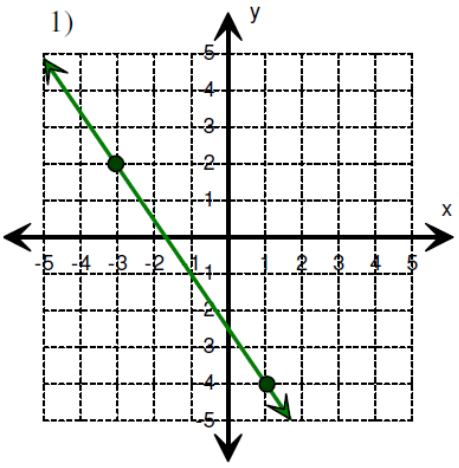
_____

56. $m = 0.75d + 2$

_____

Name _____

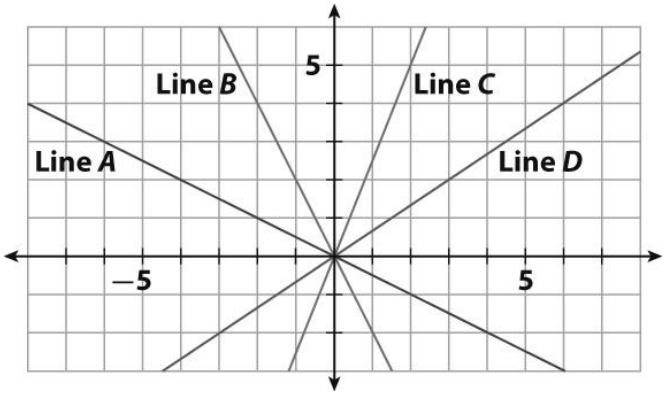
57. Find the slope of the line shown below.



Slope: _____

Is this line proportional? How do you know?

58. Which line has a slope of -2?



A line *A*

B line *B*

C line *C*

D line *D*

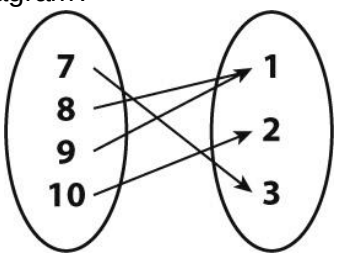
59. Which ordered pair belongs to the function shown by this mapping diagram?

A (1, 7)

B (2, 8)

C (7, 4)

D (8, 1)



60. What is the slope and *y*-intercept of the graph of $y = 3x - 5$?

slope = _____

y-intercept = _____

61. What are the slope and *y*-intercept of the relationship in the table below?

Months	1	2	3
Savings	$225	$300	$375

slope = _____

y-intercept = _____

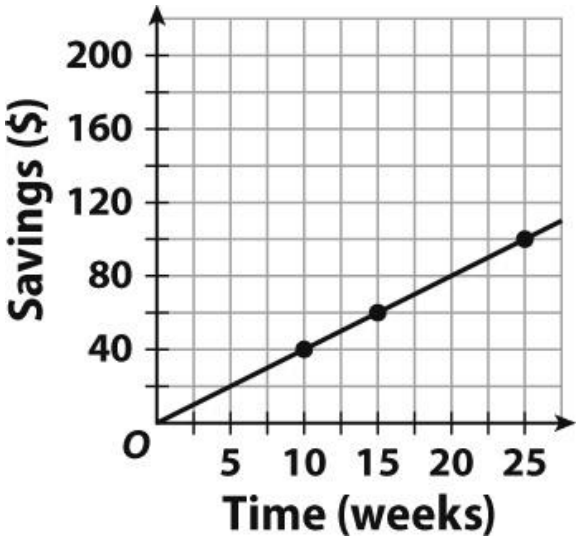
62. What does the graph of a proportional relationship look like?

A a straight line through (0, 0)

B a vertical line through (10, 0)

C a horizontal line through (0, 10)

Use the graph for 63–64.



63. Complete the table to display the data shown on the graph.

Time (weeks)				
Savings ($)				

64. Find the constant of proportionality and write an equation for the relationship.

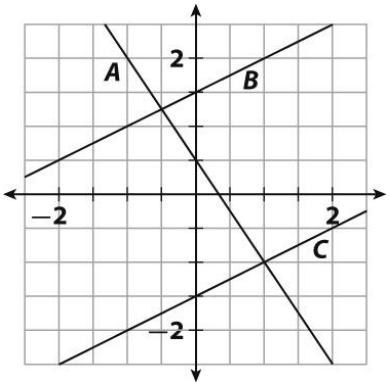
_____

Name _____

65. Carla is renting a canoe. It costs $80 for 2 hours and $110 for 4 hours. What is the rate of change for this situation?

Answer: _____

66. Which line has a positive slope and a positive *y*-intercept? Write the equation for it.



Line ____

Equation _____

67. A repairman charges $75 plus $40 per hour. Write an equation for this situation? What is the initial value, the cost when the time is 0 hours?

Equation: _____ Initial value _____

Does the data show direct variation? Write *yes* or *no*. If the data shows direct variation, write an equation to describe the relationship.

68.

Time (s)	0.5	1	1.5	2
Distance (ft)	4	16	36	64

_____

69.

Thickness (in.)	1	2	3	4
R-value	3.14	6.28	9.42	12.56

_____

70.

Hot Air (ft^3)	50	100	500	1000
Lift (lb)	1	2	10	20

_____

71.

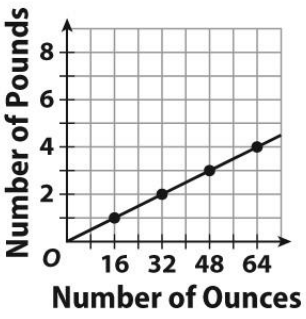
°Celsius	5	10	20	30
°Fahrenheit	41	50	68	86

_____

Solve.

72. The number of pounds in a bag of flour varies directly with the number of ounces. Write a direct variation equation that describes the relationship. Use your equation to determine the number of pounds in 152 ounces.

_____



Name _____

73. Find the **slope** of each table. **Also circle the table that is non-proportional!**

x	*y*
-3	-16.5
-2	-11
2	11
3	16.5
4	22

m=_____

x	*y*
-2	-2
1	5.5
2	8
3	10.5
4	13

m= _____

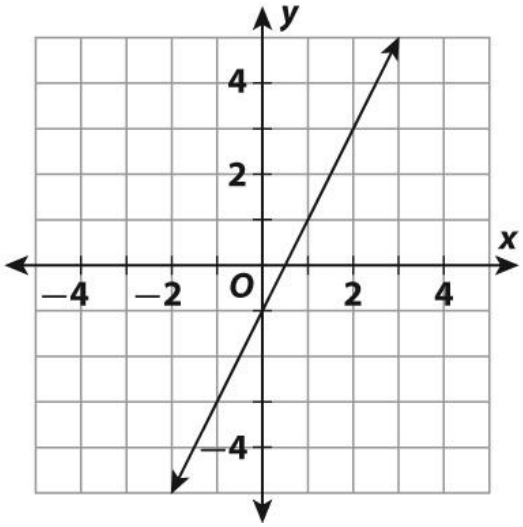
Time (Minutes)	*Distance (Miles)*
1	16
2	32
4	64
8	128
9	144

m= _____

74. The value of *y* varies directly with *x*. When *y* = 50, *x* = 4. What is the value of *y* when *x* is 8.5?

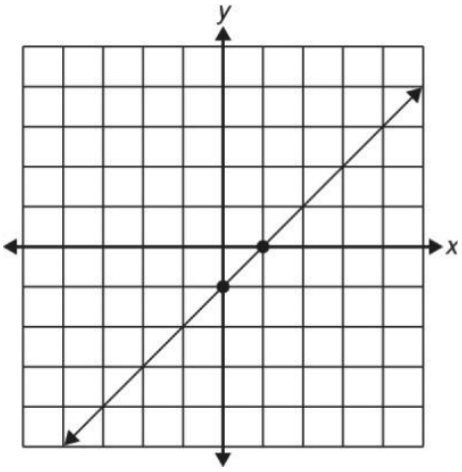
Answer_____

75. Find the equation of a line that fits the data shown in the graph below.



Equation of the line: _____

76. Find the slope and *y*-intercept of the line that is graphed on the coordinate grid below.



Slope: _____

y- intercept: _____

Equation: _____

Name _____

77. Which of the following equations has a slope of -3 and a *y*-intercept of 8?

A $y = -3x - 8$

B $y = -3x + 8$

C $y = 8x - 3$

78. 1. Which equation shows the relationship in the table?

Weeks (*x*)	2	5	10
Trees Planted (*y*)	40	100	200

A $y = 2x$

B $y = 2x + 40$

C $y = 20x$

D $y = 40x$

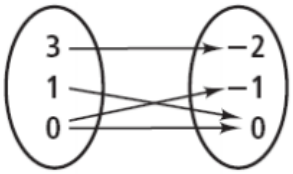
79. Which relation is a function?

A)

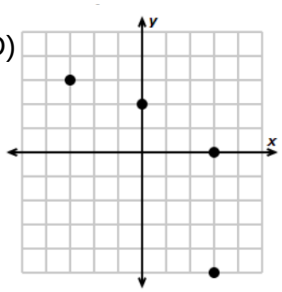
x	*y*
-5	-8
-4	-5
7	-2
7	1

B) {-1, 5), (2, 5), (3, 5) (8, 5)}

C)

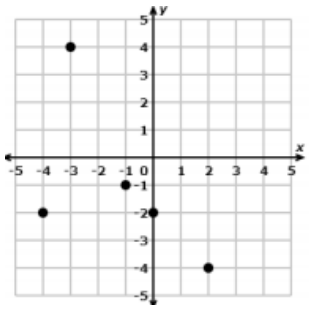


D)

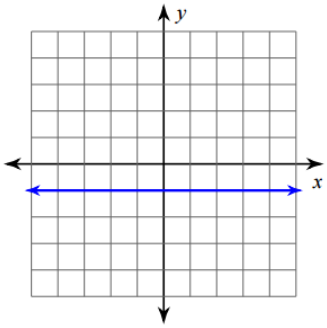


80. Which relation is **not** a function?

A)



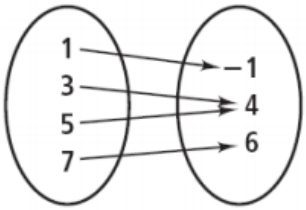
B)



C.

x	*y*
-1	-8
0	0
3	-2
3	1

D.



81. Which answer choice best describes a possible definition of a function?

A) A relation where every y is paired with exactly one x.

B). A relation where every x is paired with exactly one y.

Name _____

82. Sweetwater Tutoring offers tutoring sessions for students at a cost of $15 per session. Students must first pay a $30 new student registration fee. What equation in slope-intercept form represents the cost, *y*, for students who pay for the registration and *x* hours of tutoring?

Equation: _____

83. Which of the following is **not** a function?

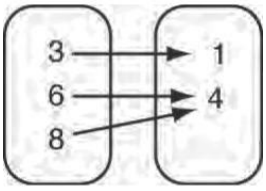
A {(2, 1), (4, 3), (6, 5), (8, 7)}

B {(2, 1), (4, 1), (6, 5), (5, 4)}

C {(2, 1), (4, 3), (6, 5), (2, 7)}

Use the diagrams below for 84-85.

Mapping A

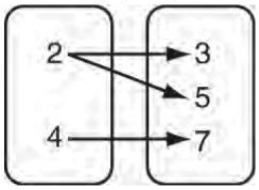


84. Which mapping diagram represents a relationship that is a function?

A Mapping A

B Mapping B

Mapping B



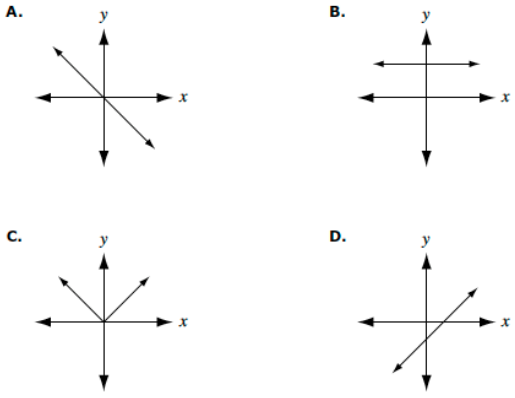
85. Which relationship is represented by Mapping B?

A {(3, 2), (5, 2), (7, 4)}

B {(2, 3), (2, 5), (4, 7)}

C {(2, 3), (2, 5), (2, 7),

86. **5.** Which represents a proportional relationship?



87. Which situation represents a proportional relationship?

A) Jacob gets paid $30 an hour at his new job.

B) Victor gets paid $10 an hour and receives a sign on bonus of $50.

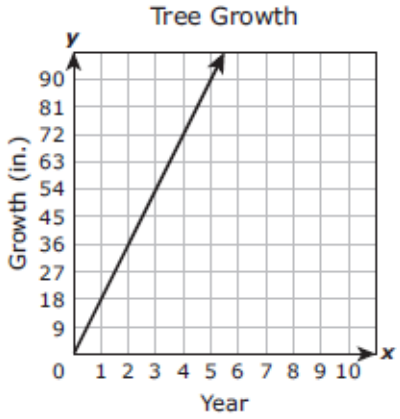
Name _____

88. Write an equation in slope-intercept form that represents the following data.

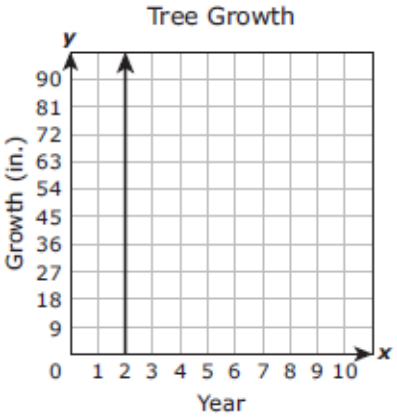
x	*y*
5	24
10	39

89. A tree in Dante's neighborhood grew 18 inches in the first 2 years after it was planted. If the tree continues to grow at this same rate, which graph best represents the growth rate of the tree in inches per year?

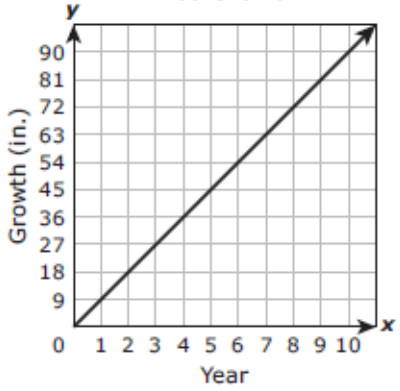
F



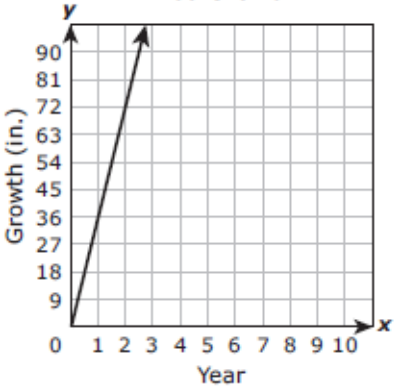
H



G



J



90. The shortest leg of a right triangle is 2 feet and the hypotenuse measures 7 feet. What is the length of the longer leg of the triangle? Round your answer to the nearest tenth and record it on the grid below. Make sure you use the correct place value.