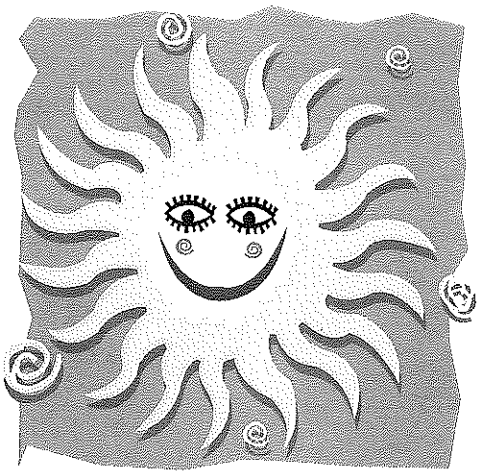
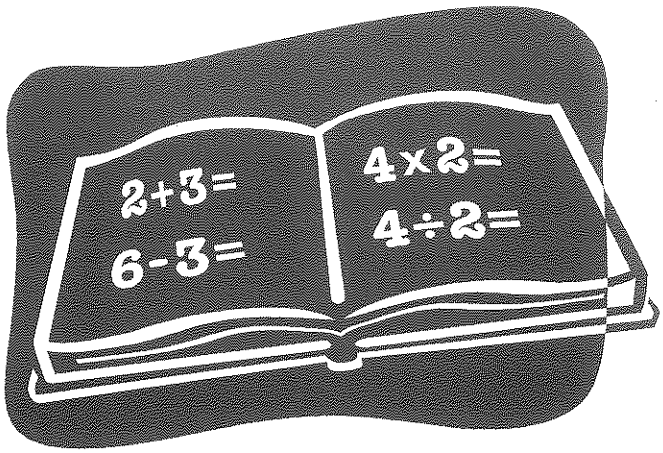


Summer Math Packet

Incoming Grade 9 Students



Student Name: _____

Perth Amboy Public School Summer 2019

Perth Amboy
Public Schools

June, 2019

Dear Parents, Guardians, and Students,

Perth Amboy Public Schools is committed to promoting Mathematics throughout the summer months in order to enhance each student's mathematical proficiency and to further develop their mathematical understanding. Although your child has acquired new skills during this school year, he/she may lose ground if a review of the grade level concepts and skills does not continue over the summer!

This summer, your child is being asked to complete the attached summer Math packet. Completion of the summer math packet will result in extra credit points to begin the year! The summer Math packet will be due by **September 20, 2019.** Your child's teacher will discuss, collect, and assess the summer assignment.

Parents are strongly encouraged to work with their children on these packets. When parents stay closely involved in their child's academic life, positive results can be sure to follow. Let's work together – as parent, teacher, and student – to ensure a productive beginning to a successful school year this fall.

Have a safe, happy, and healthy summer!

Regards,

The Perth Amboy Middle School Math Team

Perth Amboy
Public Schools

Junio 2019

Estimados Padres, Guardianes y Estudiantes,

El distrito escolar de Perth Amboy se ha comprometido a mejorar la área de las matemáticas durante los dos meses de verano con el fin de aumentar las destrezas matemáticas de cada estudiante y para desarrollar aún más la capacidad de su entendimiento de las matemáticas por toda la vida. Recuerde que, aunque el niño ha adquirido nuevas habilidades durante este año escolar, él / ella puede perder destrezas si no continúa repasando durante el verano!

Este verano, ***se le pide a su hijo(a) que complete el paquete de matemáticas incluido con esta carta***. ¡La asignación completa resultará en puntos extra para comenzar el año escolar! El paquete de matemáticas se tiene que entregar el **20 de septiembre de 2019**. El maestro de su hijo/a va a evaluar la asignación de verano.

Les sugerimos a los padres que por favor ayuden a sus hijos. Cuando los padres estan invuelto en la vida académica de sus hijos, ellos tiene mas posibilidades de tener resultados positivos. Vamos a trabajar juntos – como padre, maestro y estudiante - para asegurar un principio productivo para el año escolar.

¡Tengan un verano seguro, feliz y saludable!

Un cordial saludo,

El Equipo de Matemáticas de la Escuela Intermedia del Districto de Perth Amboy

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 (Incoming 9th Grade)

1. The area of a figure is 64 square centimeters. Suppose the sides of the figure are doubled. What will be the new area of the similar figure?

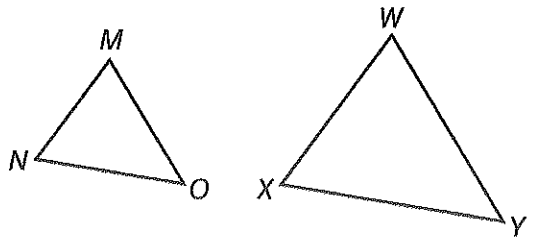
A. 16 square centimeters

B. 32 square centimeters

C. 128 square centimeters

D. 256 square centimeters

2. Triangle *MNO* is similar to triangle *WXY*. Which of the following statements is not necessarily true?



F. $\angle Y = \angle O$

G. $\frac{MO}{MN} = \frac{WX}{WY}$

H. $\angle N = \angle X$

I. $\frac{MN}{NO} = \frac{WX}{XY}$

3. SHORT ANSWER A moving company charges \$30 plus \$0.15 per mile to rent a moving van. Another company charges \$15 plus \$0.20 per mile to rent the same van. For how many miles will the cost be the same for the two companies? Write and solve an equation.

4. A marching band has 64 members. The band director wants to arrange the band members into a square formation. How many band members will be in each row?

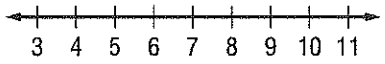
A. 8

B. 7

C. 6

D. 5

5. Between which two integers does $\sqrt{42}$ lie on the number line?



F. between 5 and 6

G. between 6 and 7

H. between 7 and 8

I. between 8 and 9

6. What are the slope and *y*-intercept of the linear equation below?

$$y = \frac{2}{3}x - 1$$

A. slope: $\frac{2}{3}$, *y*-intercept: (0, –1)

B. slope: $\frac{2}{3}$, *y*-intercept: (–1, 0)

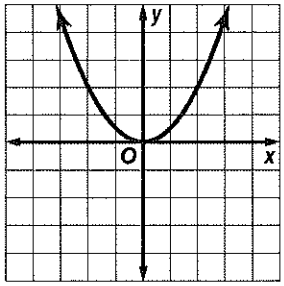
C. slope: –1, *y*-intercept: $\left(0, \frac{2}{3}\right)$

D. slope: –1, *y*-intercept: $\left(\frac{2}{3}, 0\right)$

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

7. What is the equation of the quadratic function shown in the graph?



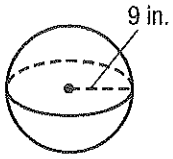
F. $y = x^2$

G. $y = x^2$

H. $y = 2x^2$

I. $y = \frac{1}{2}$

8. What is the volume of a sphere with a radius of 9 inches?



A. 1016π in^3

B. 972π in^3

C. 486π in^3

D. 324π in^3

9. What are the x- and y-intercepts of the linear equation below?

$$-5x + 3y = -15$$

F. (3, 0) and (0, –5)

G. (0, 3) and (–5, 0)

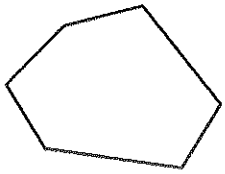
H. (–5, 0) and (3, 0)

I. (0, 3) and (0, –5)

10. SHORT ANSWER The two-way table shows the number of boys and girls in the school band and choir. Is there a greater percentage of girls in the school band or in the choir? Explain.

	Band	Choir
Boys	14	5
Girls	12	9

11. What is the sum of the measures of the interior angles of a hexagon?



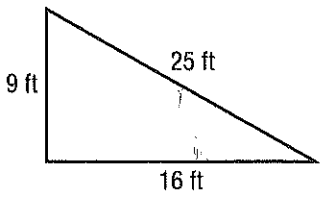
A. 540°

B. 720°

C. 900°

D. 1,080°

12. SHORT ANSWER Determine whether the following figure is a right triangle. Justify your answer.



NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

13. A soup can has a diameter of 8 centimeters and a height of 15 centimeters. About how much soup does the can hold? Use 3.14 for π. Round to the nearest tenth.

F. 376.8 cm^3

G. 753.6 cm^3

H. 1028.7 cm^3

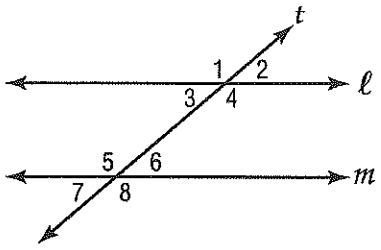
I. 3014.4 cm^3

14. SHORT ANSWER The table shows the number of goals scored by the Cougars so far this soccer season.

Game	1	2	3	4	5
Goals Scored	3	2	6	5	4

What is the mean absolute deviation?

15. Parallel lines l and m are intersected by transversal t as shown below. Which of the following angles are alternate interior angles?



A. 1 and 5

B. 4 and 6

C. 2 and 7

D. 3 and 6

16. What is the distance between points $L(-5, 7)$ and $M(3, -8)$?

F. 9 units

G. 13 units

H. 15 units

I. 17 units

17. The slope of a line is -3 and the y-intercept is $(0, 4)$. What is the equation of the line in slope-intercept form?

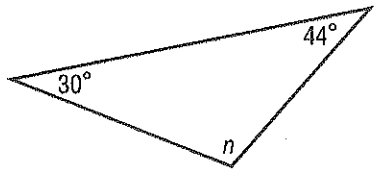
A. $y = -\frac{1}{3}x + 4$

B. $y = \frac{1}{3}x - 4$

C. $y = 3x + 4$

D. $y = -3x + 4$

18. What is the value of n in the triangle below?



F. 68°

G. 74°

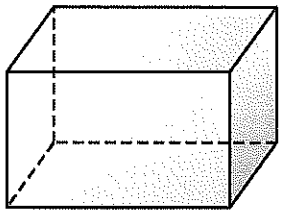
H. 96°

I. 106°

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

19. Suppose the dimensions of a rectangular prism are enlarged by a factor of 3. By what scale factor will the volume of the prism be scaled?



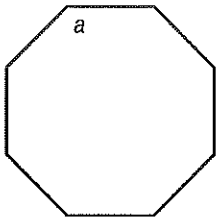
A. $\frac{1}{3}$

B. 3

C. 9

D. 27

20. What is the measure of an interior angle of a regular octagon?



F. 1,080°

G. 720°

H. 540°

I. 135°

21. SHORT ANSWER What is the expression $(3x^2y^3)^3$ simplified?

22. Which equation is equivalent to $3x + 2y = -2$?

A. $y = \frac{2}{3}x - 5$

B. $y = \frac{3}{2}x + 7$

C. $y = -\frac{3}{2}x - 1$

D. $y = \frac{2}{3}x + 4$

23. Which of the following symbols when placed in the blank results in a true number sentence?

$1.7\overline{3}$ _____ $\sqrt{3}$

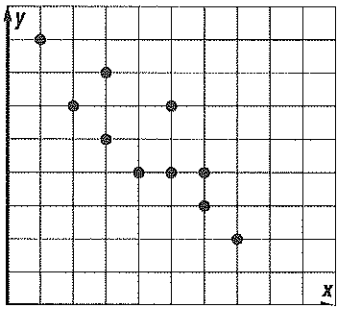
F. =

G. >

H. <

I. ×

24. What type of relationship is shown in the scatter plot below?



A. positive

B. negative

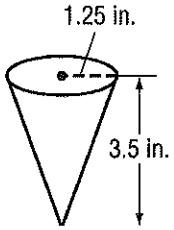
C. skewed

D. no relationship

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

25. About how much water can the paper drinking cup shown below hold? Use 3.14 for π. Round to the nearest tenth.



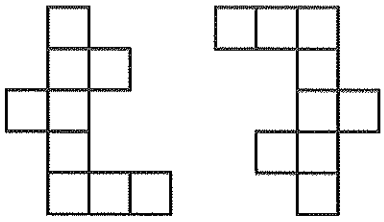
F. 17.2 cubic inches

G. 9.2 cubic inches

H. 5.7 cubic inches

I. 4.8 cubic inches

26. SHORT ANSWER Determine if the two figures below are congruent by using transformations. Explain your reasoning.



27. Which two points form a line that has a slope of $\frac{5}{2}$?

A. (3, 6) and (–1, –4)

B. (–4, 2) and (7, –1)

C. (–4, 7) and (–9, 5)

D. (3, –7) and (8, 4)

28. What is the constant rate of change of the function represented in the table below?

x	*y*
–6	–7
–3	–1
0	5
3	11

F. 2

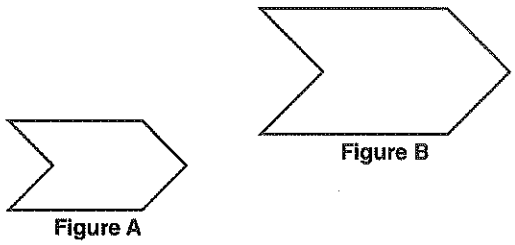
G. 3

H. 5

I. 6

29. SHORT ANSWER What is the equation of the line that passes through (–6, –6) and (12, 9)?

30. Which transformations could have been used to map Figure A onto Figure B?



A. dilation, translation

B. dilation, reflection

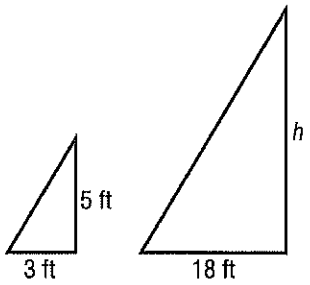
C. reflection, rotation

D. translation, rotation

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

31. Katie is 5 feet tall. She casts a 3-foot long shadow at the same time that a flagpole casts an 18-foot long shadow.



What is the height of the flagpole?

F. 10.8 ft

G. 22.4 ft

H. 28 ft

I. 30 ft

32. What is the approximate surface area of a cylinder with a height of 12 meters and a base radius of 2 meters? Use 3.14 for π. Round to the nearest tenth if necessary.

A. 242.1 m^2

B. 175.8 m^2

C. 150.7 m^2

D. 124.5 m^2

33. The distance from the Sun to Venus is about 1.08×1011 meters. If light travels at a speed of 3×108 meters per second, about how long does it take light from the sun to reach Venus?

F. 3.6×10^2 seconds

G. 4.2×10^2 seconds

H. 1.083×10^{11} seconds

I. 3.24×10^{19} seconds

34. Which of the following is equivalent to 2^{-4}?

A. -16

B. -8

C. $\frac{1}{32}$

D. $\frac{1}{16}$

35. What is the range of the function shown in the table?

x	-7	-5	-3	-1	1
y	4	6	1	-2	-3

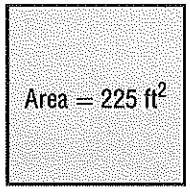
F. all integers

G. all odd integers

H. {–3, –2, 1, 4, 6}

I. {–7, –5, –3, –1, 1}

36. SHORT ANSWER The area of a square patio is 225 square feet. What is the perimeter of the patio?



37. A cone has a height of 24 inches, a slant height of 25 inches, and a diameter of 14 inches. What is the surface area of the cone?

A. $1{,}176\pi$ in^2

B. 392π in^2

C. 224π in^2

D. 178π in^2

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

38. A hotel shuttle service charges \$7.50 plus \$0.85 per mile. A customer hires a shuttle, and the total charge is \$12.60. Which equation can be used to determine the number of miles from the hotel to the airport?

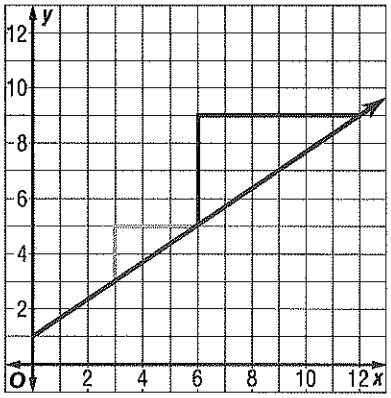
F. $0.85m + 7.5 = 12.6$

G. $7.5m + 0.85 = 12.6$

H. $8.35m = 12.6$

I. $6.65m = 12.6$

39. SHORT ANSWER What is the relationship between the slope of the line and the side lengths of the triangles?



40. The population of the United States is about 3.1×10^8 people. What is this number written in standard form?

A. 3,100,000

B. 31,000,000

C. 310,000,000

D. 3,100,000,000

41. Which expression is equivalent to the expression below?

$$c \cdot c \cdot c \cdot c \cdot d \cdot d \cdot c \cdot d \cdot c \cdot c \cdot d$$

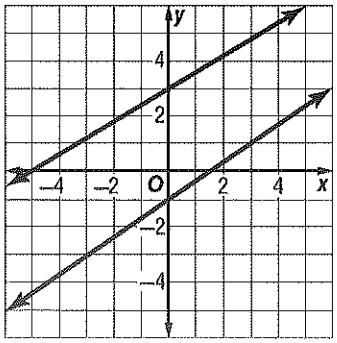
F. $(cd)^3$

G. $c^{-7}d^{-4}$

H. $(cd)^{11}$

I. c^7d^4

42. What is the solution to the system of linear equations shown below?



A. (0, 3)

B. (5, 6)

C. (–5, –4)

D. no solution

43. Jasmine determines figure $ABCD \cong$ figure $FGHI$. If $AB = 14$ meters, $BC = 11$ meters, $CD = 9$ meters, and $AD = 17$ meters, what is the length of $\overline{GH}$?

F. 9 m

G. 11 m

H. 14 m

I. 17 m

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

44. SHORT ANSWER Twenty years ago, Mr. Williams purchased a classic car for $65,000. The table below shows the value of the car over time. Write an equation that represents the data.

Years from Purchase	Value (thousands)
0	$65
5	$67.5
10	$70
15	$72.5
20	$75

What will be the value of the car when it has been 30 years since he purchased it?

45. What is the slope of the line that passes through points $R(0, 2)$ and $T(-3, -4)$?

A. 2

B. $\frac{1}{2}$

C. $-\frac{1}{2}$

D. -2

46. Robert has $220 in his savings account. He plans to save an additional $15 each month. Which function can Robert use to determine how much he will have saved s after m months?

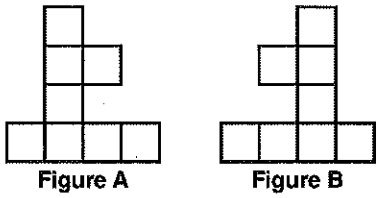
F. $s(m) = 220m + 15$

G. $s(m) = 235m$

H. $s(m) = 15m + 220$

I. $s(m) = 15m$

47. What type of transformation is represented by the figures below?



A. dilation

B. reflection

C. rotation

D. translation

48. Which of the following equations represents a vertical line?

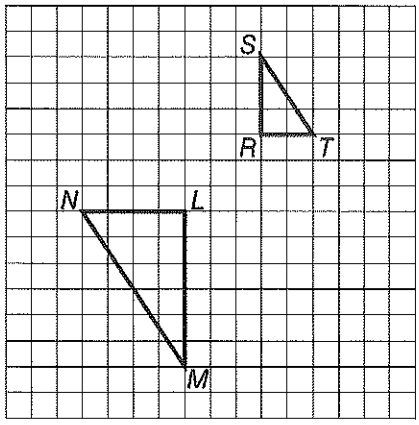
F. $y = x$

G. $y = x + 10$

H. $y = 4$

I. $x = 5$

49. Which series of transformations can be used to prove that triangle RST is similar to triangle LMN?



A. reflection, dilation

B. 90° rotation, dilation

C. translation, dilation

D. 180° rotation, dilation

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

50. Which of the following statements about a line of best fit is *not* true?

F. Most of the data points are close to the line.

G. About half of the points are above the line.

H. All of the data points have to be on the line.

I. The line can be used to make conjectures.

51. The endpoints of $\overline{AR}$ are $A(8, -2)$ and $R(-4, 1)$. What is the length of $\overline{AR}$? Round to the nearest tenth.

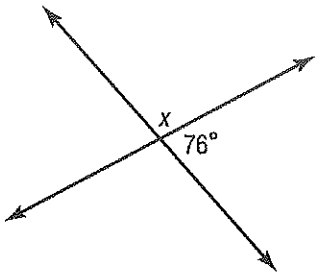
A. 12.4 units

B. 11.2 units

C. 7.5 units

D. 4.0 units

52. What is the value of x in the figure below?



F. 114°

G. 104°

H. 86°

I. 76°

53. SHORT ANSWER Is a triangle with side lengths of 33 inches, 56 inches, and 65 inches a right triangle? Explain your reasoning.

54. Which set lists the values below from least to greatest?

$$3^{-2}, \sqrt{3}, 1.3 \times 10^{-1}, \frac{1}{3}$$

A $\left\{\sqrt{3}, \frac{1}{3}, 1.3 \times 10^{-1}, 3^{-2}\right\}$

B $\left\{\sqrt{3}, 1.3 \times 10^{-1}, \frac{1}{3}, 3^{-2}\right\}$

C $\left\{3^{-2}, 1.3 \times 10^{-1}, \frac{1}{3}, \sqrt{3}\right\}$

D $\left\{3^{-2}, \frac{1}{3}, 1.3 \times 10^{-1}, \sqrt{3}\right\}$

55. SHORT ANSWER The table below shows the prices of digital cameras at an electronics store. Summarize the data.

Prices of Digital Cameras ($)					
75	115	95	105	115	95
100	100	70	80	105	75
120	95	115	175	105	110

56. What is the value of v in the equation below?

$$3(2v + 1) = -15(5v + 16)$$

F. $\frac{13}{81}$

G. $\frac{5}{27}$

H. -2

I. -3

57. What is the solution to the equation below?

$$0.4p + 0.1 = 1.15$$

A. 3.125

B. 2.625

C. 0.5

D. 0.42

NAME _____ DATE _____ PERIOD _____

Mathematics Summer Work 2019 *(continued)*

58. Solve the system of equations below.

$$7x + 6y = -10$$
$$-2x + y = 11$$

F. (–4, 3)

G. (–5, 1)

H. (7, 9)

I. no solution

59. The quadratic function $h(t) = -16t^2 + 90$ represents the height, in feet, of an object t seconds after it begins falling from a height of 90 feet. What is the height of the object after 2 seconds?

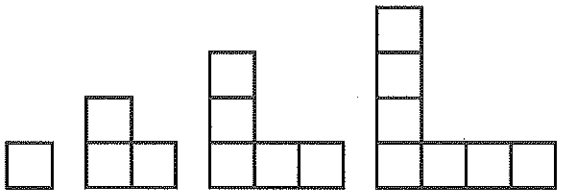
A. 22 ft

B. 26 ft

C. 58 ft

D. 154 ft

60. Let n represent the figure number in the pattern below.



Which function represents the number of squares used to create each figure?

F. $f(n) = n^2$

G. $f(n) = n^2 - 1$

H. $f(n) = 2n - 1$

I. $f(n) = 2n + 1$

61. By what factor would you need to multiply the dimensions of a polygon in order for the resulting image to have a perimeter that is equal to 4 the original perimeter?

A. $\frac{1}{4}$

B. $\frac{1}{2}$

C. 2

D. 4

62. A rectangular-shaped school courtyard has a length of 280 feet and a width of 150 feet wide. What is the approximate length of a diagonal of the courtyard to the nearest tenth?

F. 430.0 ft

G. 395.4 ft

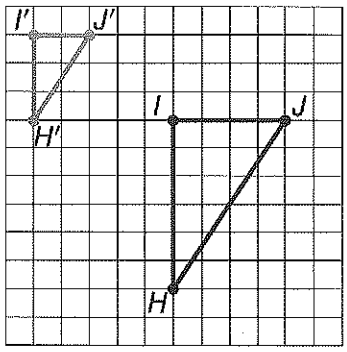
H. 317.6 ft

I. 295.1 ft

63. SHORT ANSWER Does the data in the table represent a linear or nonlinear function? Explain your reasoning.

x	y
–7	–37
–2	–7
1	11
5	35
7	47

64. What is the scale factor of the dilated figure shown below?



A. 0.25

B. 0.5

C. 2

D. 4

65. Point $A(-7, -3)$ is reflected across the y-axis. What are the coordinates of the image?

F. $A'(3, -7)$

G. $A'(-7, 3)$

H. $A'(-3, -7)$

I. $A'(7, -3)$

Mathematics Summer Work 2019 (Incoming 9th Grade)

Please bubble in the correct answer for multiple choice items and write your response to the short answer items in the space provided. If more space is needed please number and complete on the back of this sheet.

Name: _____

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓕ Ⓖ Ⓗ Ⓘ
3.
4. Ⓐ Ⓑ Ⓒ Ⓓ
5. Ⓕ Ⓖ Ⓗ Ⓘ
6. Ⓐ Ⓑ Ⓒ Ⓓ
7. Ⓕ Ⓖ Ⓗ Ⓘ
8. Ⓐ Ⓑ Ⓒ Ⓓ
9. Ⓕ Ⓖ Ⓗ Ⓘ
10.
11. Ⓐ Ⓑ Ⓒ Ⓓ
12.
13. Ⓕ Ⓖ Ⓗ Ⓘ
14.
15. Ⓐ Ⓑ Ⓒ Ⓓ
16. Ⓕ Ⓖ Ⓗ Ⓘ
17. Ⓐ Ⓑ Ⓒ Ⓓ
18. Ⓕ Ⓖ Ⓗ Ⓘ
19. Ⓐ Ⓑ Ⓒ Ⓓ
20. Ⓕ Ⓖ Ⓗ Ⓘ
21.
22. Ⓐ Ⓑ Ⓒ Ⓓ
23. Ⓕ Ⓖ Ⓗ Ⓘ
24. Ⓐ Ⓑ Ⓒ Ⓓ
25. Ⓕ Ⓖ Ⓗ Ⓘ
26.
27. Ⓐ Ⓑ Ⓒ Ⓓ
28. Ⓕ Ⓖ Ⓗ Ⓘ
29.
30. Ⓕ Ⓖ Ⓗ Ⓘ
31. Ⓐ Ⓑ Ⓒ Ⓓ
32. Ⓕ Ⓖ Ⓗ Ⓘ
33. Ⓐ Ⓑ Ⓒ Ⓓ
34. Ⓕ Ⓖ Ⓗ Ⓘ
35. Ⓐ Ⓑ Ⓒ Ⓓ
36.
37. Ⓐ Ⓑ Ⓒ Ⓓ
38. Ⓕ Ⓖ Ⓗ Ⓘ
39.
40. Ⓐ Ⓑ Ⓒ Ⓓ
41. Ⓕ Ⓖ Ⓗ Ⓘ
42. Ⓐ Ⓑ Ⓒ Ⓓ
43. Ⓕ Ⓖ Ⓗ Ⓘ
44.
45. Ⓐ Ⓑ Ⓒ Ⓓ
46. Ⓕ Ⓖ Ⓗ Ⓘ
47. Ⓐ Ⓑ Ⓒ Ⓓ
48. Ⓕ Ⓖ Ⓗ Ⓘ
49. Ⓐ Ⓑ Ⓒ Ⓓ
50. Ⓕ Ⓖ Ⓗ Ⓘ
51. Ⓐ Ⓑ Ⓒ Ⓓ
52. Ⓕ Ⓖ Ⓗ Ⓘ
53.
54. Ⓐ Ⓑ Ⓒ Ⓓ
55.
56. Ⓕ Ⓖ Ⓗ Ⓘ
57. Ⓐ Ⓑ Ⓒ Ⓓ
58. Ⓕ Ⓖ Ⓗ Ⓘ
59. Ⓐ Ⓑ Ⓒ Ⓓ
60. Ⓕ Ⓖ Ⓗ Ⓘ
61. Ⓐ Ⓑ Ⓒ Ⓓ
62. Ⓕ Ⓖ Ⓗ Ⓘ
63.
64. Ⓐ Ⓑ Ⓒ Ⓓ
65. Ⓕ Ⓖ Ⓗ Ⓘ