

Name: _____

Date: _____

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Circle the letter of the best answer.

- Tennis players enter a tournament in which 25% of them are eliminated after each round. If 90 players remain after two rounds, how many players started the tournament?
 - 160
 - 180
 - 200
 - 220
- A fundraiser is offering cupcakes and hot dogs at a baseball game. Cupcakes are \$1.50 and hot dogs are \$2.25. If the goal of the fundraiser is \$100, what inequality expresses the scenario?
 - $1.5x + 2.25y \geq 100$
 - $1.5x + 2.25y \leq 100$
 - $1.5x + 2.25y < 100$
 - $1.5x + 2.25y > 100$
- Ahmed purchased a bicycle at the shop at a 15% discount on the original price. If he was charged \$115, what was the original price?
 - \$130
 - \$135.29
 - \$121.05
 - \$136.05
- Annabelle does downhill skiing in the winter. She pays \$150 for ski rental for the season, and \$15 per day for ski lifts. If at the end of the season she is charged \$255, how many days did she ski?
 - 5
 - 6
 - 7
 - 8
- A plant species population grows by 16% every week. If the original population is 1,200 plants, what is the expected population at the end of 8 weeks?
 - 2,924
 - 3,391
 - 3,934
 - 4,563

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6. Penelope and Teresa each think of a number. If you multiply Penelope's number by 2 and add Teresa's number, the result is 10. If you multiply Teresa's number by 2 and add Penelope's number, the result is 11. What are the numbers?
- a. 2 and 3
 b. 3 and 4
 c. 3 and 5
 d. 4 and 2
7. What is the fourth term of the series defined by $t_n = 2n + t_{n-1}$ if $t_0 = 1$?
- a. 23
 b. 21
 c. 27
 d. 29
8. The following figures show a pattern.



Figure 1

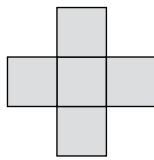


Figure 2

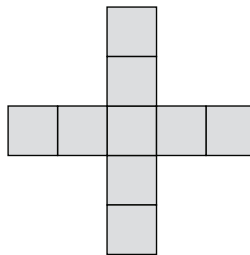


Figure 3

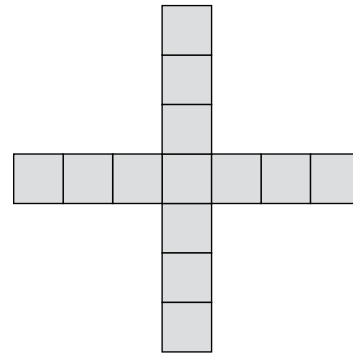


Figure 4

Which option describes what the 100th figure in this pattern would look like?

- a. There would be 1 square in the middle with 99 squares on each of the 4 sides.
 b. There would be 1 square in the middle with 100 squares on each of the 4 sides.
 c. There would be 1 square in the middle with 101 squares on each of the 4 sides.
 d. The 100th figure cannot be determined.
9. Which of the following is true for the function $f(x) = x - 3$?
- a. $f(x)$ is increasing between 0 and 5 and has an x -intercept at $x = 3$.
 b. $f(x)$ is decreasing between 0 and 5 and has an x -intercept at $x = 3$.
 c. $f(x)$ is decreasing between 0 and 5 and has an x -intercept at $x = -3$.
 d. $f(x)$ is increasing between 0 and 5 and has an x -intercept at $x = -3$.

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10. The function $t(x)$ describes the temperature of an object placed inside a refrigeration chamber (a box or room that makes things cold). What are a reasonable domain and range for this function?
- domain: $x > 0$; range: $y < 0$
 - domain: $x > 0$; range: $y < t(0)$
 - domain: $x > 0$; range: all real numbers
 - domain: all real numbers; range: all real numbers
11. Experimental data shows the following relationship between x and y :

x	0	1	2	3	4	5
y	-1	0	3	8	15	24

What is the average rate of change from $x = 0$ to $x = 2$?

- 2
 - 4
 - 1
 - 5
12. The value of a stock share over the past 6 months is given in the following table:

Month	Value
1	\$1.00
2	\$1.50
3	\$2.00
4	\$2.70
5	\$3.00

What is the rate of change on the interval $1 < x < 3$?

- \$3.00 per month
- \$2.00 per month
- \$1.00 per month
- \$0.50 per month

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15. On December 31, Myriam had some money in her checking account. On the 15th of each month of the new year, she deposits enough money to double the balance in the account. Myriam makes a withdrawal of \$756 on June 20, after which the balance is \$5,004. What was the starting balance?

- a. \$85
b. \$90
c. \$95
d. \$100

16. Nina invites 3 friends to a school event. Each of them, in turn, invites another 3 people. The number of people invited to the event in each round is shown in the table. Which function represents this relationship?

Round	People invited
0	1
1	3
2	9
3	27
4	81

- a. $f(x) = 3x$
b. $f(x) = x + 3$
c. $f(x) = 3^x - 3$
d. $f(x) = 3^x$

17. Two boats are sailing on the same river in opposite directions. Boat A is sailing downstream, and boat B is sailing upstream. Boat A travels at 5 mph, and boat B travels at 6 mph relative to the river water. The river flows downstream at 2 mph. If the boats are 18 miles apart, how many hours will it take for them to meet?

- a. 4
b. 5
c. 6
d. 7

18. If $a_n = a_{n-1} + 1.5$ and $a_3 = 4$, find a_5 .

- a. 5.5
b. 4.5
c. 6.5
d. 7

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19. The function $g(x)$ is a transformation of $f(x)$, such that $g(x) = f(x) - 2$. How will the graph of $g(x)$ differ from that of $f(x)$?
- The graph will be shifted down by 2 units.
 - The graph will be shifted up by 2 units.
 - The graph will be shifted right by 2 units.
 - The graph will be shifted left by 2 units.
20. The base of a right triangle is one half its height. If the height is 5 feet, what is the area of the triangle in square feet? Use the formula $A = \frac{1}{2}bh$.
- 3
 - 4.25
 - 5.25
 - 6.25
21. What is the solution to the system of linear equations?
- $$\begin{cases} y - 2x = -5 \\ y - x = 3 \end{cases}$$
- (8, 11)
 - (9, 10)
 - (10, 10)
 - (10, 11)
22. What is the solution to the system of linear equations?
- $$\begin{cases} y - 2x = 0 \\ 2(y + x) = 18 \end{cases}$$
- $y = 6, x = 3$
 - $y = 6, x = -6$
 - $y = 3, x = -3$
 - $y = -6, x = -3$

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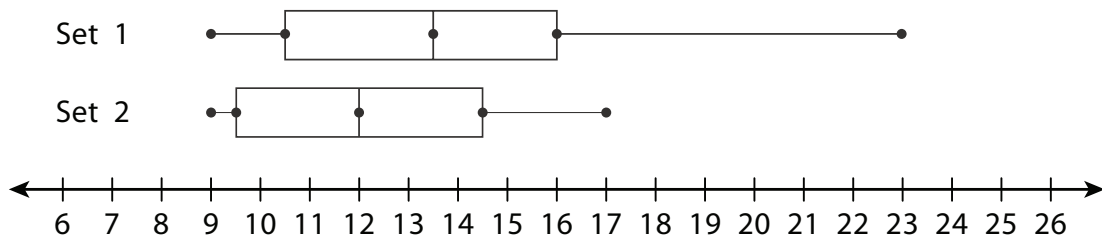
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23. Given the following system of equations, which statement is true?

$$\begin{cases} x + 2y = 15 \\ 2x + y = 9 \end{cases}$$

- The solution is (1, 7); the lines intersect at a single point.
- The solution is (1, 7); the lines are parallel.
- There is no solution; the lines are parallel.
- There are infinite solutions; the graphs are the same line.

24. Which of the following data sets has the greater median?



- Set 1
 - Set 2
 - The two sets have the same median.
 - There is not enough information to solve this problem.
25. In the following data set, what is the limit above which values would be classified as outliers (i.e., the upper boundary)?

Minimum	Q ₁	Median	Q ₃	Maximum	Mean
0.4	1.0	3.0	4.3	7.5	3.03

- 9
- 9.25
- 9.5
- 9.75

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26. A publishing company conducted a market test on three books to determine the preferences of male and female readers. Results are shown in the following table. What percentage of women surveyed preferred Book 1? What percentage of respondents were men who preferred Book 3?

	Book 1	Book 2	Book 3	Totals
Male	25	40	35	100
Female	62	23	15	100
Totals	87	63	50	200

- a. 7.5 and 17.5
 b. 15 and 35
 c. 62 and 17.5
 d. 62 and 25
27. A teacher offers his students an opportunity to improve their scores on a quiz. The table shows the initial scores and the improved scores. Which linear equation models this data set best?

Initial score	Improved score
32	45
33	48
33	43
35	46
36	48
37	45
37	47
38	46
39	46
40	48
40	43
43	60

- a. $y = 1.34x + 17.25$
 b. $y = 0.98x + 21$
 c. $y = 0.74x + 19.89$
 d. $y = 0.42x + 13.7$

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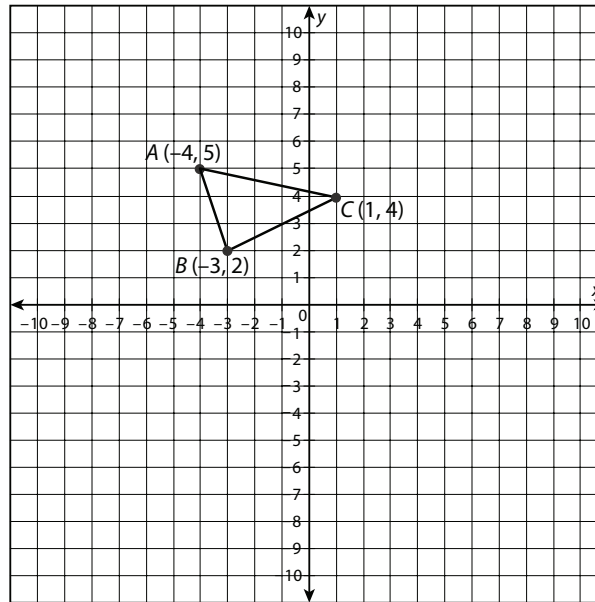
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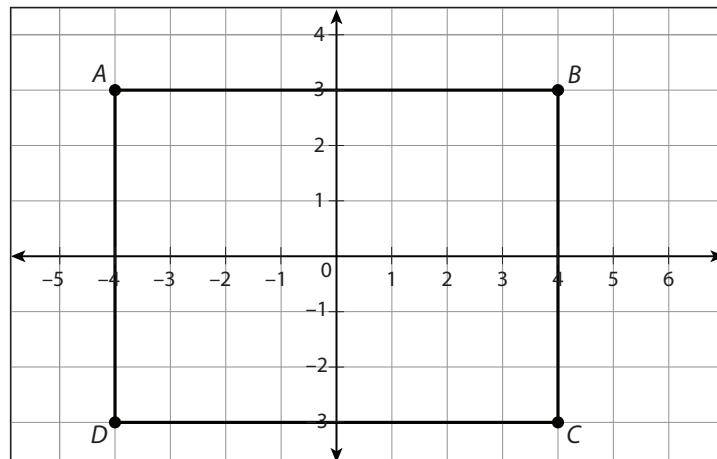
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28. Given $\triangle ABC$, identify the coordinates of $\triangle A'B'C'$ if $\triangle ABC$ is translated five (5) units down and two (2) units to the left.



- a. $A' = (-11, 3); B' = (-8, 0); C' = (-4, 2)$ c. $A' = (-6, 0); B' = (-5, -3); C' = (-1, -1)$
b. $A' = (-11, 7); B' = (-8, 4); C' = (-4, 6)$ d. $A' = (-2, 0); B' = (-1, -3); C' = (3, -1)$

29. Given rectangle $ABCD$, what transformation will carry the rectangle onto itself?



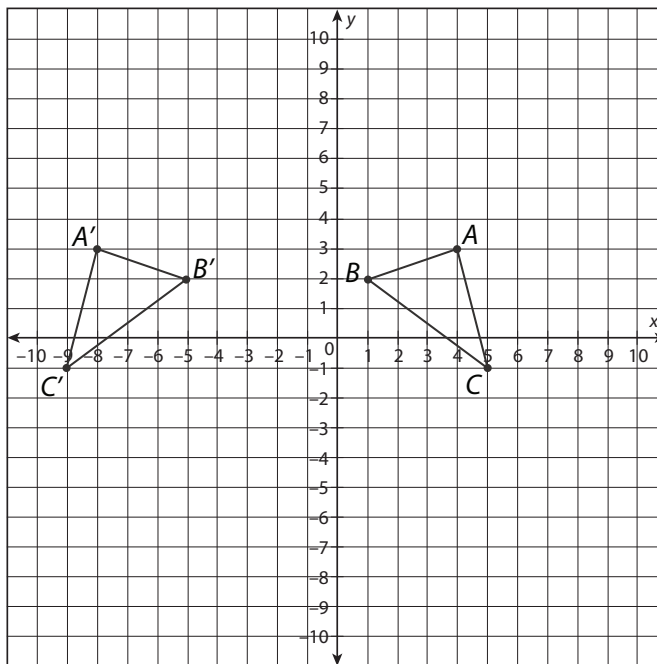
- a. Reflection across the line $y = x$
b. Clockwise rotation of 90°
c. Reflection over the y -axis, then a counterclockwise rotation of 90°
d. Reflection over the x -axis, then a clockwise rotation of 180°

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30. Which transformation maps $\triangle ABC$ onto $\triangle A'B'C'$?



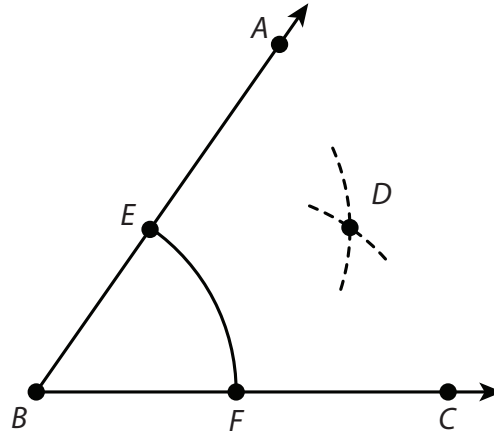
- Reflection over the y -axis
 - Counterclockwise rotation of 180°
 - Reflection over the line $x = -2$
 - Clockwise rotation of 90°
31. The transformation $(x', y') \rightarrow (x - 3, y + 4)$ is applied to a triangle with vertices $(3, 3)$, $(2, 5)$, and $(0, 0)$. What are the coordinates of the vertices of the transformed triangle?
- $(-3, 4)$, $(-5, -1)$, and $(3, 4)$
 - $(0, -4)$, $(6, -2)$, and $(4, 1)$
 - $(7, -1)$, $(6, 2)$, and $(4, -3)$
 - $(0, 7)$, $(-1, 9)$, and $(-3, 4)$

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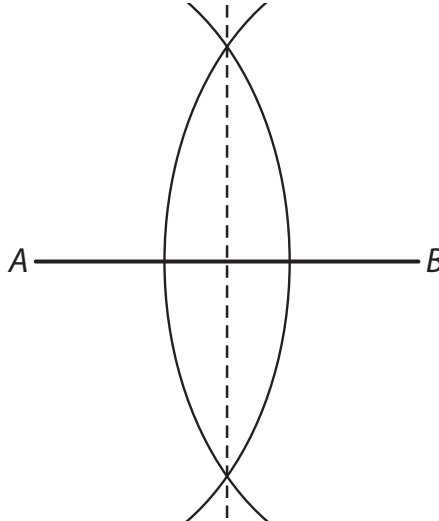
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32. Given the construction of the bisection of $\angle ABC$, which statement is true?



- a. Point D is located such that $ED = CD$.
 b. Point D is located such that $BD = CD$.
 c. Point D is located such that $ED = FD$.
 d. Point D is located such that $AD = ED$.

33. What geometric construction is shown in the following figure?



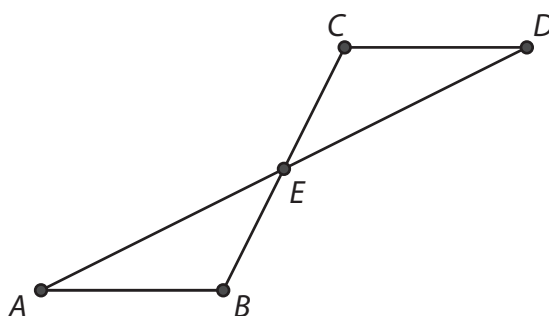
- a. a line parallel to a given line
 b. a perpendicular bisector
 c. an angle bisector
 d. a proportional segment

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37. In $\triangle ABC$ and $\triangle XYZ$, $\angle A \cong \angle X$, $\angle B \cong \angle Y$, and $\overline{AB} \cong \overline{XY}$. Which of the following statements is true?
- a. $\triangle ABC \cong \triangle XYZ$ by the AAS criteria. c. $\triangle ABC \cong \triangle XYZ$ by the SSS criteria.
 b. $\triangle ABC \cong \triangle XYZ$ by the SAS criteria. d. $\triangle ABC \cong \triangle XYZ$ by the ASA criteria.
38. Given: $\overline{CD} \parallel \overline{AB}$ and E is the midpoint of \overline{AD}
 Prove: $\triangle ABE \cong \triangle DCE$



Choose the statement that completes the proof.

Statements	Reasons
1. $\overline{CD} \parallel \overline{AB}$ and E is the midpoint of \overline{AD}	Given
2. $\angle CED \cong \angle BEA$	Vertical Angles Theorem
3. $\overline{AE} \cong \overline{ED}$	
4. $\angle BAE \cong \angle CDE$	Alternate Interior Angles Theorem
5. $\triangle ABE \cong \triangle DCE$	ASA

- a. Corresponding Parts of Congruent Triangles are Congruent
 b. Corresponding Angles Theorem
 c. Definition of Midpoint
 d. SSS Theorem

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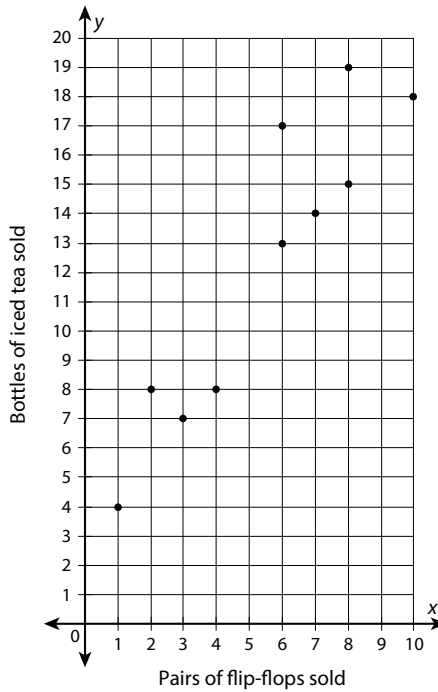
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43. The Beachside General Store compared the number of pairs of flip-flops it sold with the number of bottles of iced tea it sold from 12:00 P.M. to 1:00 P.M. each day for a period of 10 days. The results are shown in the table and in the scatter plot. Use this information to complete the chart that follows.

Pairs of flip-flops sold	3	6	1	6	8	10	7	8	2	4
Bottles of iced tea sold	7	13	4	17	19	18	14	15	8	8



	Yes	No	Explain why or why not.
Is this an example of correlation?	<input type="checkbox"/>	<input type="checkbox"/>	
Is this an example of causation?	<input type="checkbox"/>	<input type="checkbox"/>	

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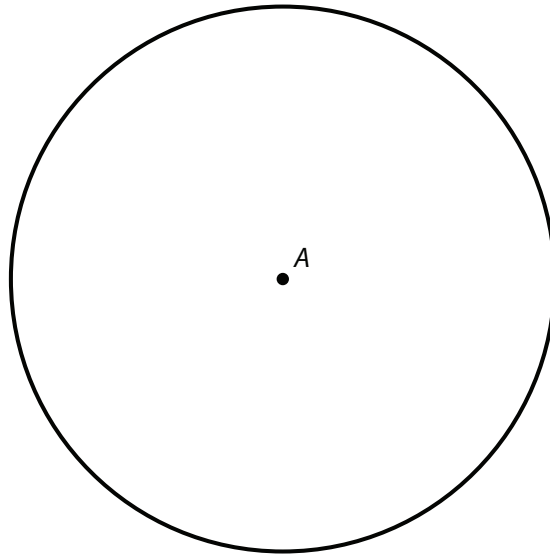
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44. Construct a square inscribed in the circle below.



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45. The following figure shows $\triangle RST$, with vertices $R(2, -3)$, $S(3, 1)$, and $T(7, 0)$. Prove or disprove that $\triangle RST$ is a right isosceles triangle.

