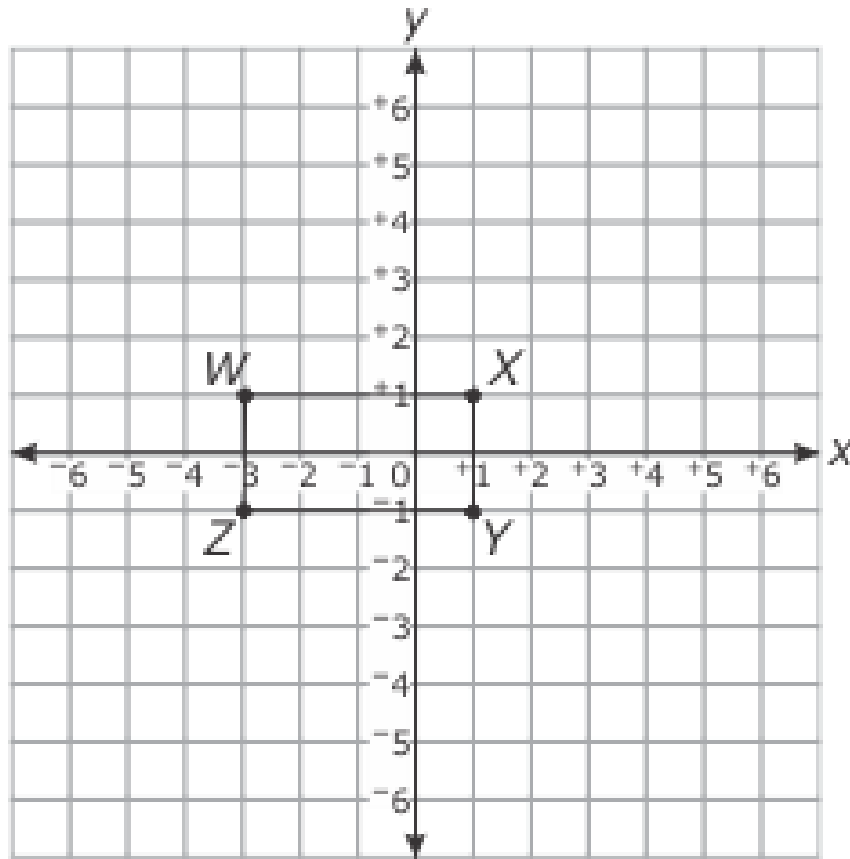


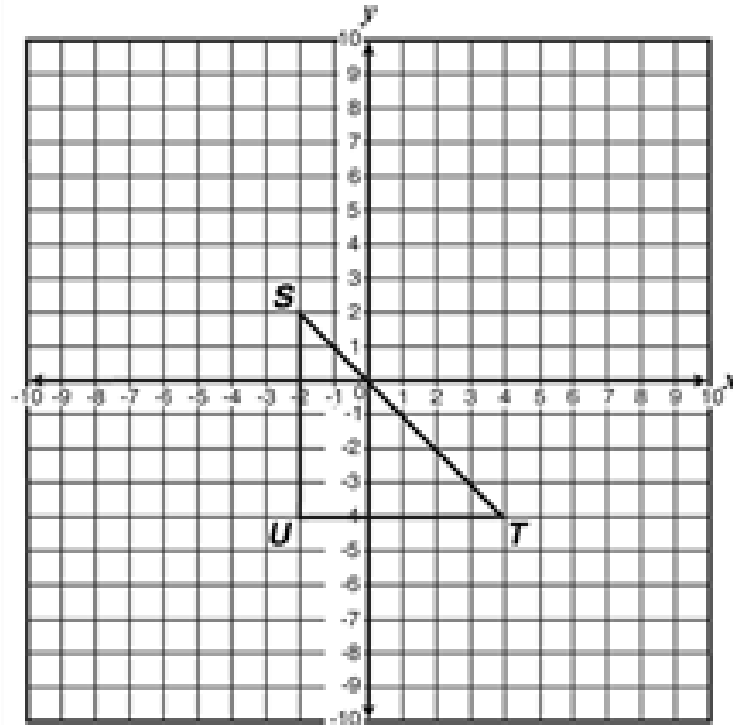
1. Rectangle  $WXYZ$  will be dilated by a scale factor of  $\frac{1}{2}$ , creating rectangle  $W'X'Y'Z'$ .



What will be the perimeter of rectangle  $W'X'Y'Z'$ ?

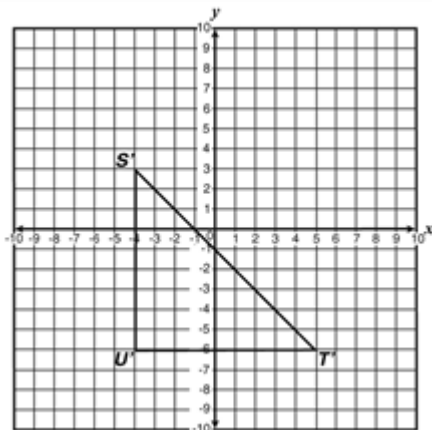
- A 4 units
- B 6 units
- C 12 units
- D 24 units

2. The diagram shows Triangle  $STU$  on the coordinate plane.

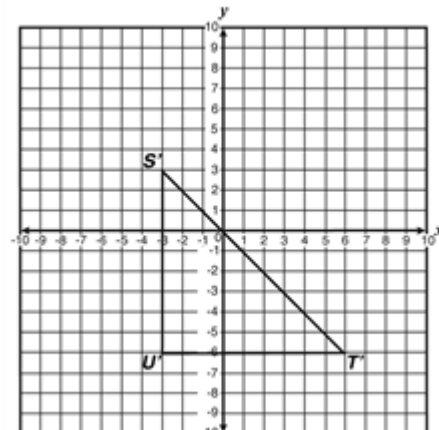


Which graph shows the result of the dilation  $(x, y) \rightarrow (1.5x, 1.5y)$ ?

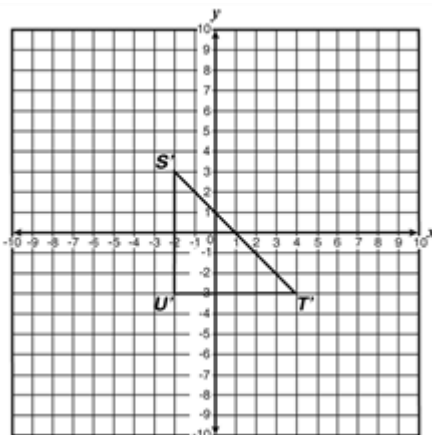
**A**



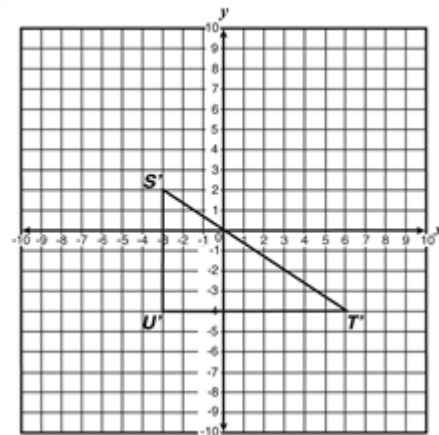
**C**



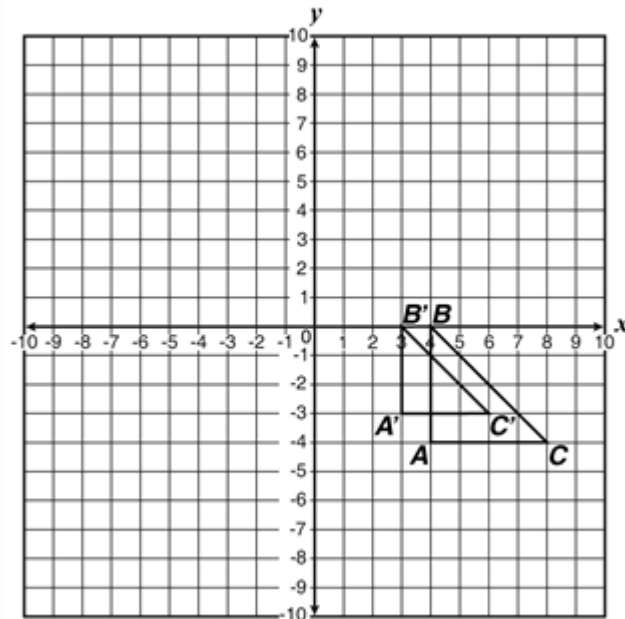
**B**



**D**



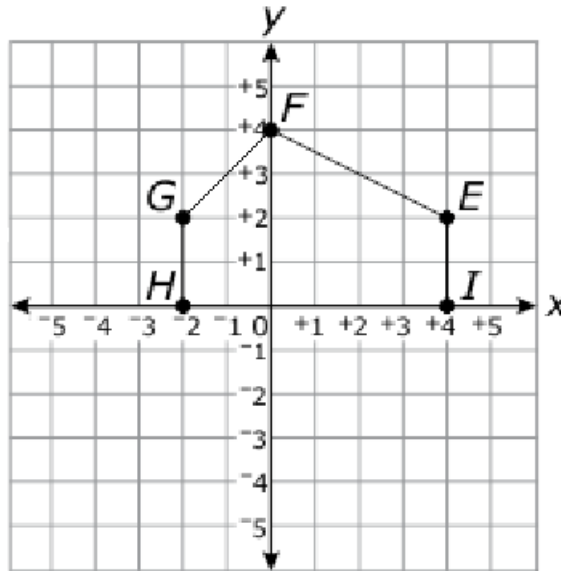
3. In the diagram below, Triangle  $A'B'C'$  is the result of a transformation of Triangle  $ABC$ .



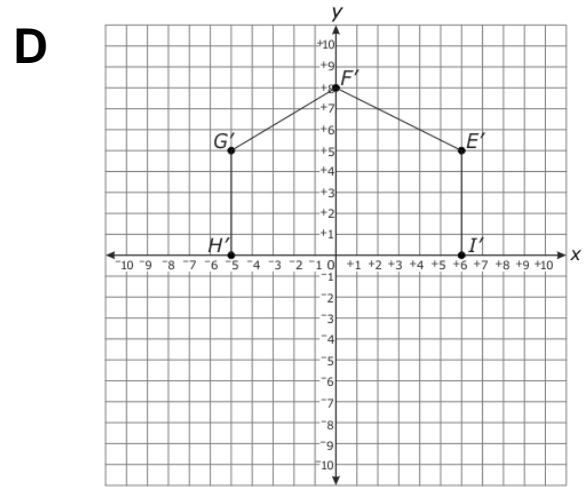
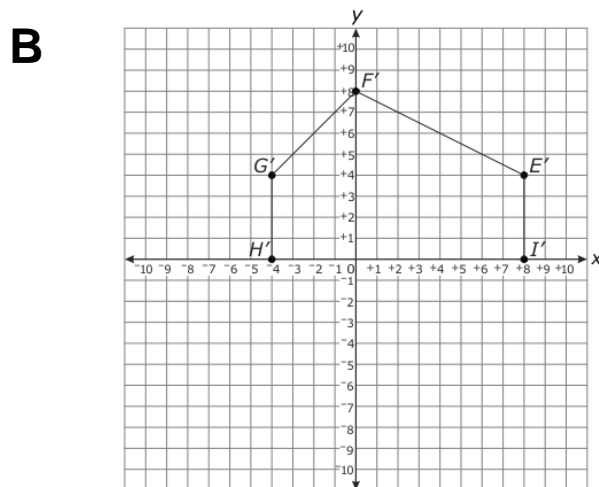
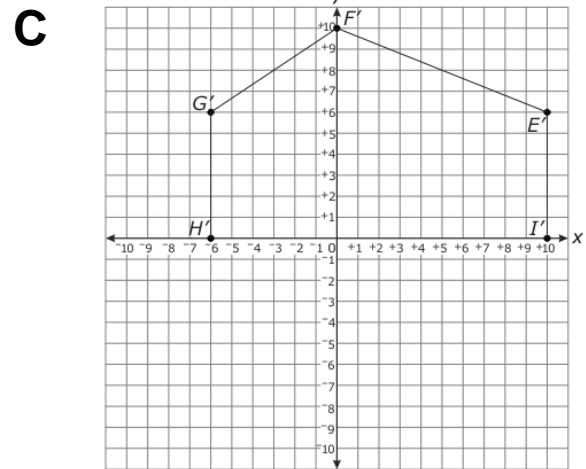
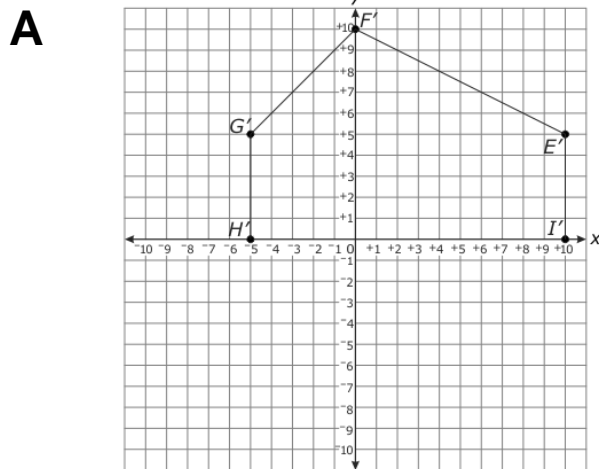
Which algebraic representation BEST describes this transformation?

- A  $(x, y) \rightarrow \left(\frac{2}{3}x, \frac{2}{3}y\right)$
- B  $(x, y) \rightarrow \left(\frac{3}{4}x, \frac{3}{4}y\right)$
- C  $(x, y) \rightarrow (x - 1, y + 1)$
- D  $(x, y) \rightarrow (x - 2, y + 1)$

4. Pentagon  $EFGHI$  will be dilated by a scale factor of 2.5.



Which image represents pentagon  $E'F'G'H'I'$ ?



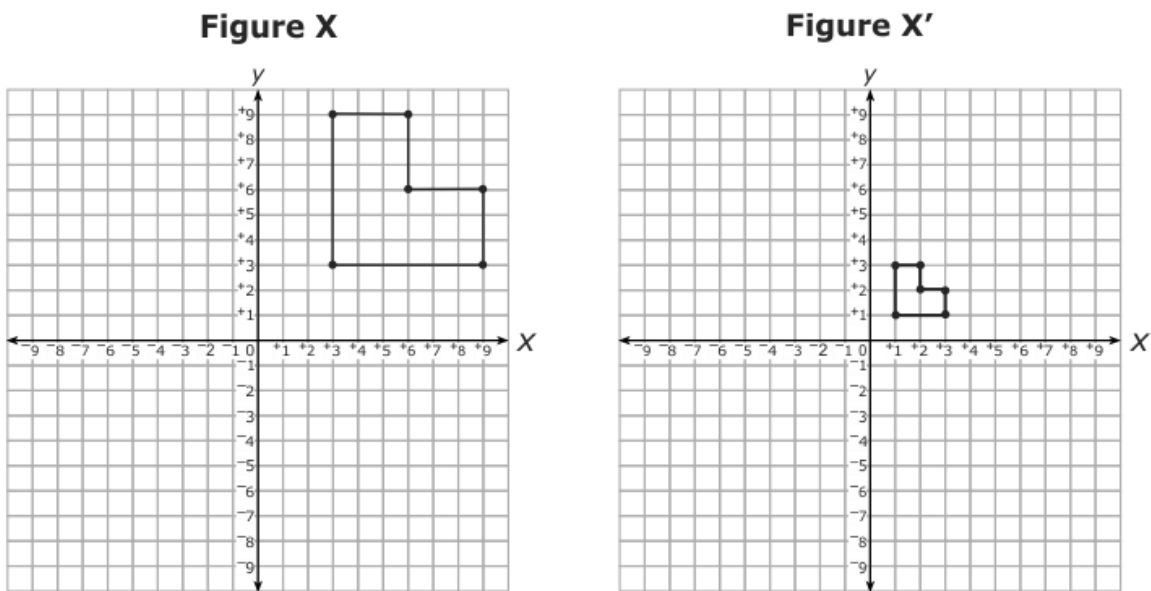
5. A geometric transformation is described algebraically as shown below.

$$(x, y) \rightarrow (3x, 3y)$$

Which BEST describes this transformation?

- A a translation 3 units up and 3 units to the right
- B a translation 3 units down and 3 units to the left
- C a  $180^\circ$  degree rotation centered at the point (3, 3)
- D a dilation with scale factor 3 centered at the origin

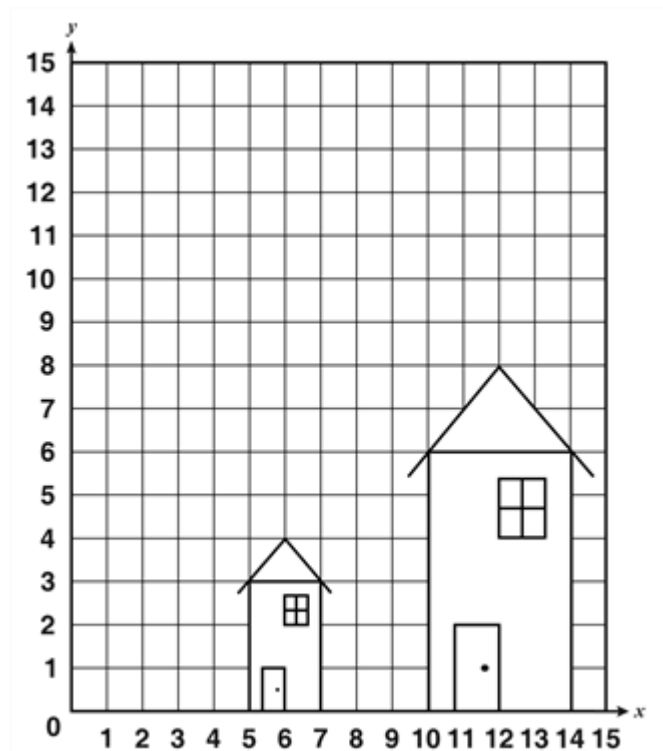
6. Figure  $X'$  is the image of figure  $X$  after a dilation.



What scale factor was used for the dilation?

- A 3
- B  $\frac{1}{3}$
- C 2
- D  $\frac{1}{2}$

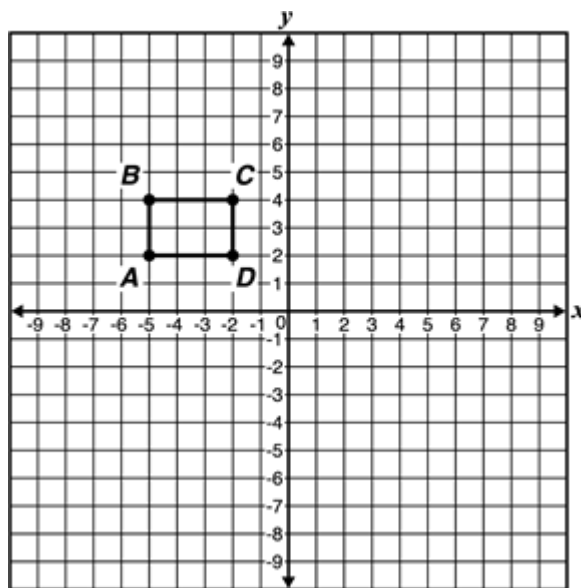
7. Emily works at a design studio that does movie animation. She made the design shown below on her computer.



Emily created the smaller house first, then dilated that image to produce the larger house. Which algebraic representation BEST describes the dilation?

- A  $(x, y) \rightarrow (2x, 2y)$
- B  $(x, y) \rightarrow (5x, 5y)$
- C  $(x, y) \rightarrow (x + 2, y + 4)$
- D  $(x, y) \rightarrow (x + 5, y + 3)$

8. Rectangle  $ABCD$  is dilated by a scale factor of 2, forming rectangle  $A'B'C'D'$ . The dilation is centered about the origin.



How do the perimeters of the two rectangles compare?

- A The perimeter of  $A'B'C'D'$  is twice the perimeter of  $ABCD$ .
- B The perimeter of  $A'B'C'D'$  is one-half the perimeter of  $ABCD$ .
- C The perimeter of  $A'B'C'D'$  is four times the perimeter of  $ABCD$ .
- D The perimeter of  $A'B'C'D'$  is 8 more than the perimeter of  $ABCD$ .

9. A geometric transformation is described by the algebraic representation below.

$$(x, y) \rightarrow \left(\frac{x}{8}, \frac{y}{8}\right)$$

Which BEST describes this transformation?

- A a rotation
- B a translation
- C a dilation that makes any given figure larger
- D a dilation that makes any given figure smaller

10. Triangle  $TUV$  is transformed to create triangle  $T'U'V'$ .

Point	Coordinates	Point	Coordinates
$T$	$(2, 1)$	$T'$	$(4, 2)$
$U$	$(1, 2)$	$U'$	$(2, 4)$
$V$	$(1, 5)$	$V'$	$(2, 10)$

Which statement describes this transformation?

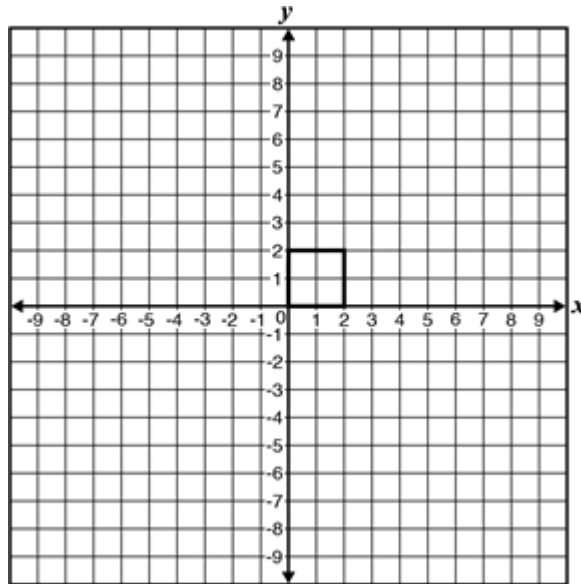
- A a translation such that  $(x, y) \rightarrow (x + 1, y + 2)$
- B a translation such that  $(x, y) \rightarrow (x + 2, y + 1)$
- C a dilation of a scale factor of  $\frac{1}{2}$  about the origin
- D a dilation of a scale factor of 2 about the origin

11. Eric drew Triangle  $JKL$  on a coordinate plane, with  $J$ :  $(-3, 5)$ ,  $K$ :  $(-1, -4)$ , and  $L$ :  $(2, 4)$ . Then he drew Triangle  $J'K'L'$ , the result of the dilation  $(x, y) \rightarrow \left(\frac{2}{3}x, \frac{2}{3}y\right)$ . What are the coordinates of Point  $J'$ ?

- A  $(-2, 5)$
- B  $\left(-2, 3\frac{1}{3}\right)$
- C  $\left(-2\frac{1}{3}, 5\frac{2}{3}\right)$
- D  $\left(-3, 3\frac{1}{3}\right)$



12. A square is dilated about the origin by a scale factor of 3.5.



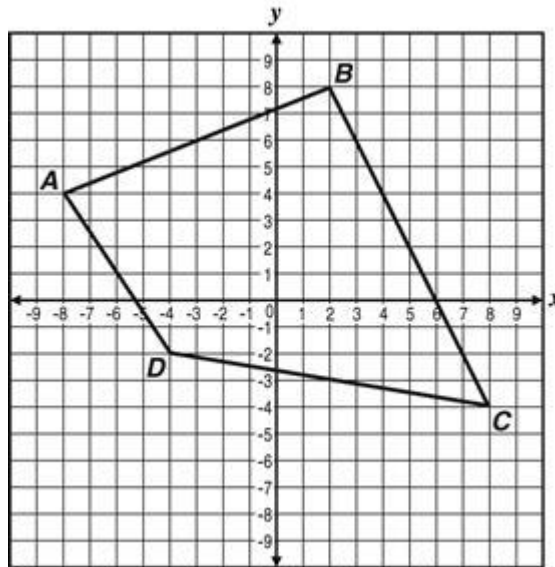
What is a true statement about the dilation as compared to the original square?

- A One of its vertices is located at  $(7, 0)$ .
- B The perimeter is 7 times the perimeter of the original square.
- C The area is 3.5 times greater than the area of the original square.
- D The measure of each angle of the dilated figure is larger by a factor of 3.5.

13. A square with the coordinates  $(0, 0)$ ,  $(0, 3)$ ,  $(3, 3)$ , and  $(3, 0)$  will be dilated by a factor of 4. What will be the new coordinates of the square?

- A  $(0, 0)$ ,  $(0, 3)$ ,  $(12, 12)$ ,  $(12, 0)$
- B  $(0, 0)$ ,  $(0, 12)$ ,  $(12, 12)$ ,  $(12, 0)$
- C  $(0, 0)$ ,  $(0, 12)$ ,  $(12, 4)$ ,  $(12, 0)$
- D  $(4, 4)$ ,  $(4, 12)$ ,  $(12, 12)$ ,  $(12, 4)$

14. Quadrilateral  $ABCD$  is shown on this grid.



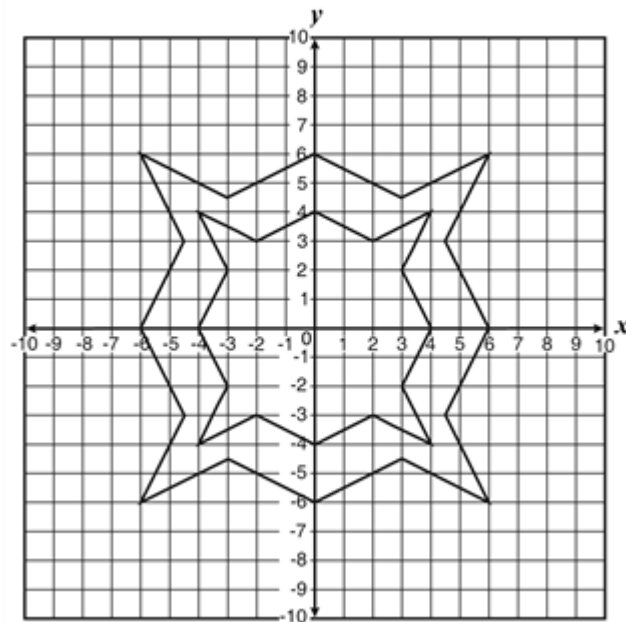
If Quadrilateral  $ABCD$  is dilated about the origin using a scale factor of  $\frac{1}{2}$  to make Quadrilateral  $A'B'C'D'$ , what will be the coordinates of  $A'$ ,  $B'$ ,  $C'$  and  $D'$ ?

- A  $A'(-4, 2)$ ,  $B'(1, 4)$ ,  $C'(4, -2)$ ,  $D'(-2, -1)$
- B  $A'(-8, 4)$ ,  $B'(2, 8)$ ,  $C'(8, -4)$ ,  $D'(-4, -2)$
- C  $A'(-10, 2)$ ,  $B'(0, 6)$ ,  $C'(6, -6)$ ,  $D'(-6, -4)$
- D  $A'(-16, 8)$ ,  $B'(4, 16)$ ,  $C'(16, -8)$ ,  $D'(-8, -4)$

15. Triangle  $XYZ$  has vertices at  $X(2, -1)$ ,  $Y(-4, -1)$ , and  $Z(2, 2)$ . The triangle will be dilated by a scale factor of 4. What will be the coordinates of triangle  $X'Y'Z'$ ?

- A  $X'(6, 3)$ ,  $Y'(0, 3)$ ,  $Z'(6, 6)$
- B  $X'(8, -1)$ ,  $Y'(-16, -1)$ ,  $Z'(8, 2)$
- C  $X'(8, -4)$ ,  $Y'(-16, -4)$ ,  $Z'(8, 8)$

**16.** A graphic artist is designing a logo for a telecommunications company. He created the smaller star first, then dilated it to produce the larger star.



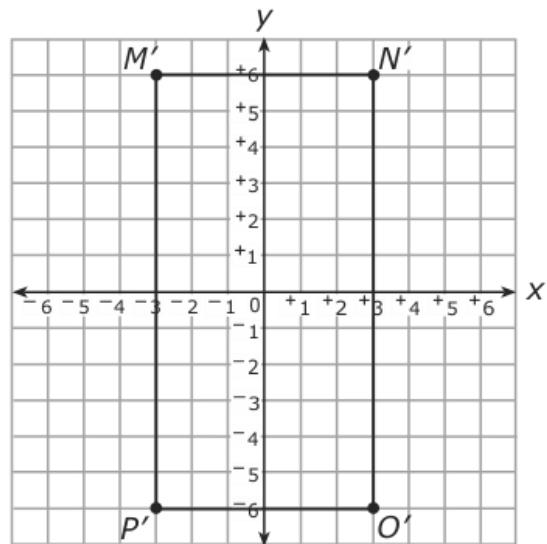
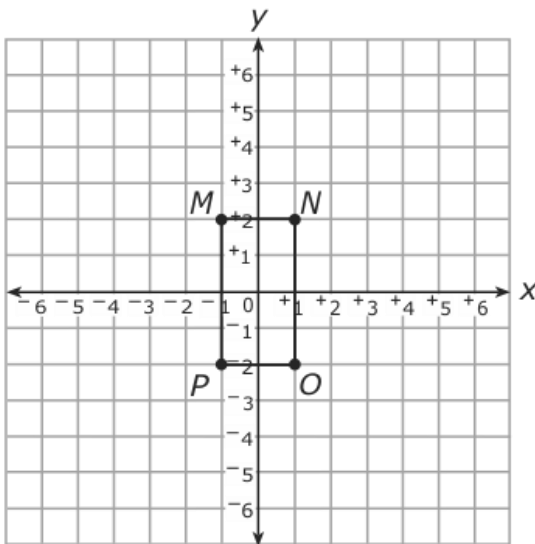
Which algebraic representation BEST describes this dilation?

- A**  $(x, y) \rightarrow \left(\frac{3}{2}x, \frac{3}{2}y\right)$
- B**  $(x, y) \rightarrow \left(\frac{5}{2}x, \frac{5}{2}y\right)$
- C**  $(x, y) \rightarrow (x, y + 2)$
- D**  $(x, y) \rightarrow (x + 2, y)$

17. The coordinates of a triangle are  $(2, -3)$ ,  $(2, -5)$ , and  $(5, -5)$ . The triangle will be dilated by a scale factor of 10. What will be the coordinates of the image triangle?

- A  $(20, -30)$ ,  $(20, 50)$ , and  $(-50, 50)$
- B  $(20, -30)$ ,  $(20, -50)$ , and  $(50, -50)$
- C  $(-20, 30)$ ,  $(20, -50)$ , and  $(-50, 50)$
- D  $(-20, 30)$ ,  $(-20, 50)$ , and  $(50, -50)$

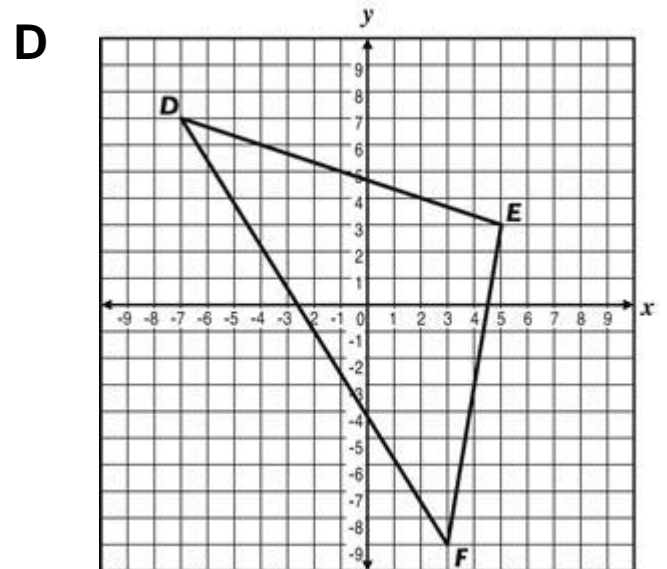
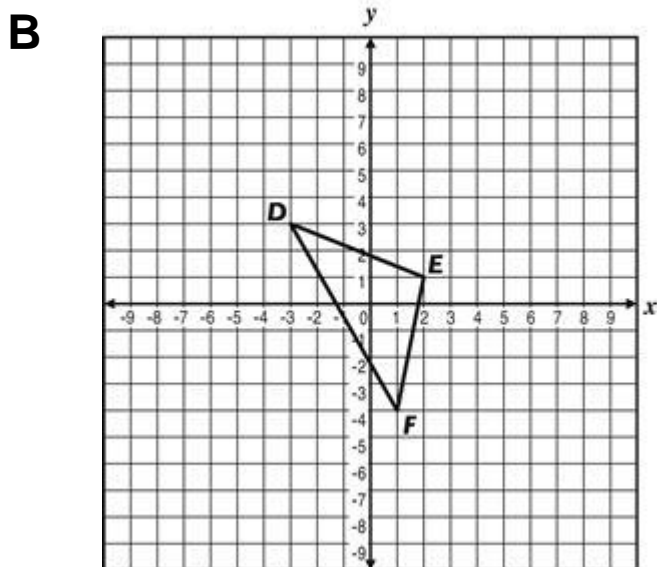
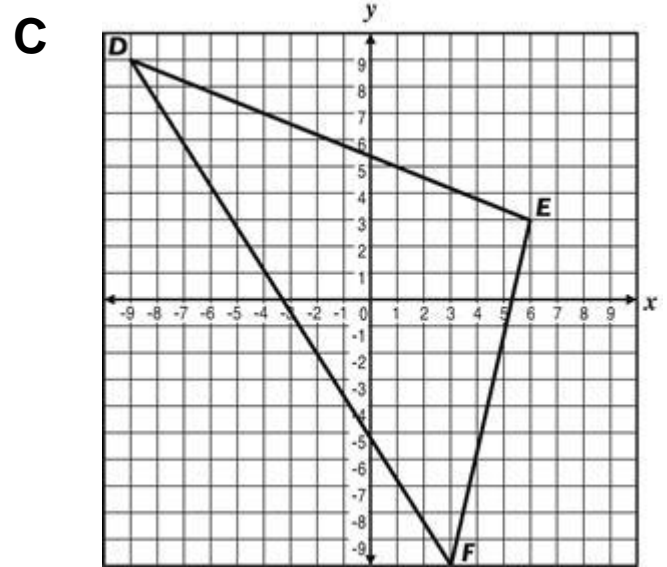
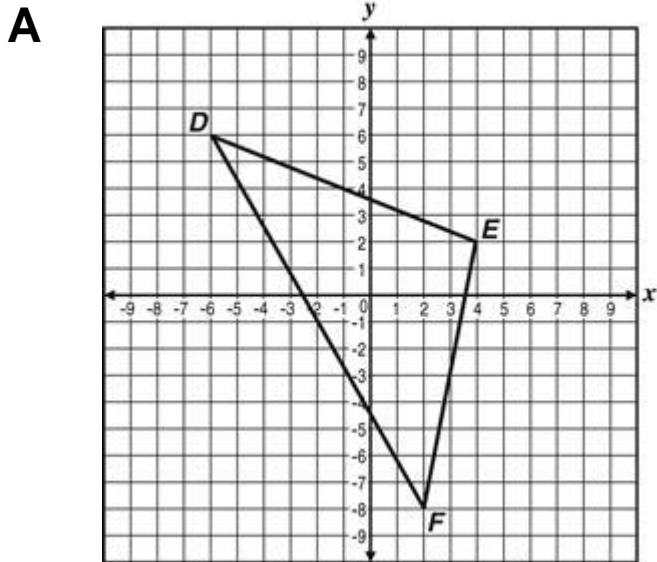
18. Rectangle  $MNOP$  was dilated producing rectangle  $M'N'O'P'$ .



What scale factor was applied to rectangle  $MNOP$  to produce rectangle  $M'N'O'P'$ ?

- A  $\frac{1}{3}$
- B  $\frac{1}{2}$
- C 2
- D 3

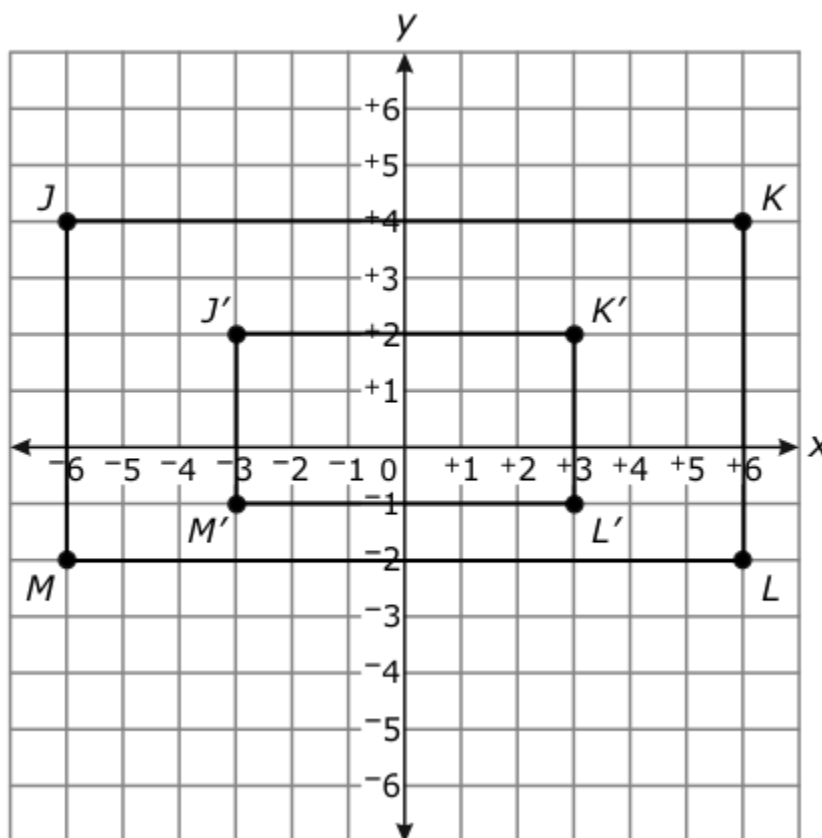
19. Triangle  $ABC$  has points  $A$ ,  $B$ , and  $C$  located at  $(-3, 3)$ ,  $(2, 1)$ ,  $(1, -4)$ , respectively. Triangle  $DEF$  is a dilation of Triangle  $ABC$  about the origin, using a scale factor of 2. Which graph shows the resulting image Triangle  $DEF$ ?



20. A triangle has the coordinates  $(-3, -1)$ ,  $(1, -2)$ , and  $(1, -4)$ . The triangle will be dilated by a scale factor of 5. What will be the coordinates of the image triangle?

- A  $(-15, -5)$ ,  $(-5, -10)$ ,  $(-5, -20)$
- B  $(-15, -5)$ ,  $(5, -10)$ ,  $(5, -20)$
- C  $(15, -5)$ ,  $(5, -10)$ ,  $(-5, 20)$
- D  $(15, 5)$ ,  $(5, 10)$ ,  $(5, 20)$

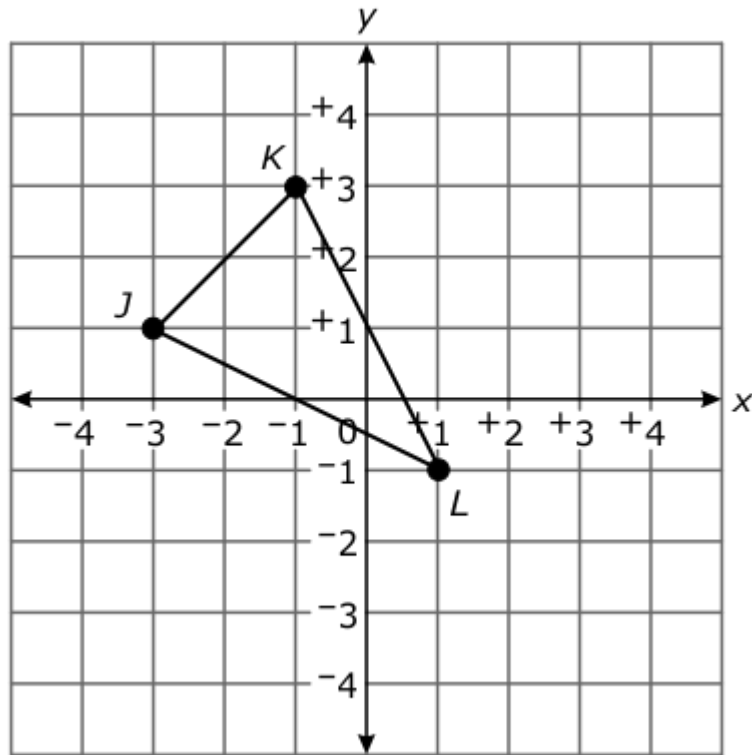
21. On the graph below, rectangle  $JKLM$  was dilated to create rectangle  $J'K'L'M'$ .



What scale factor was used for this dilation?

- A  $\frac{1}{2}$
- B 2
- C 3
- D  $\frac{1}{3}$

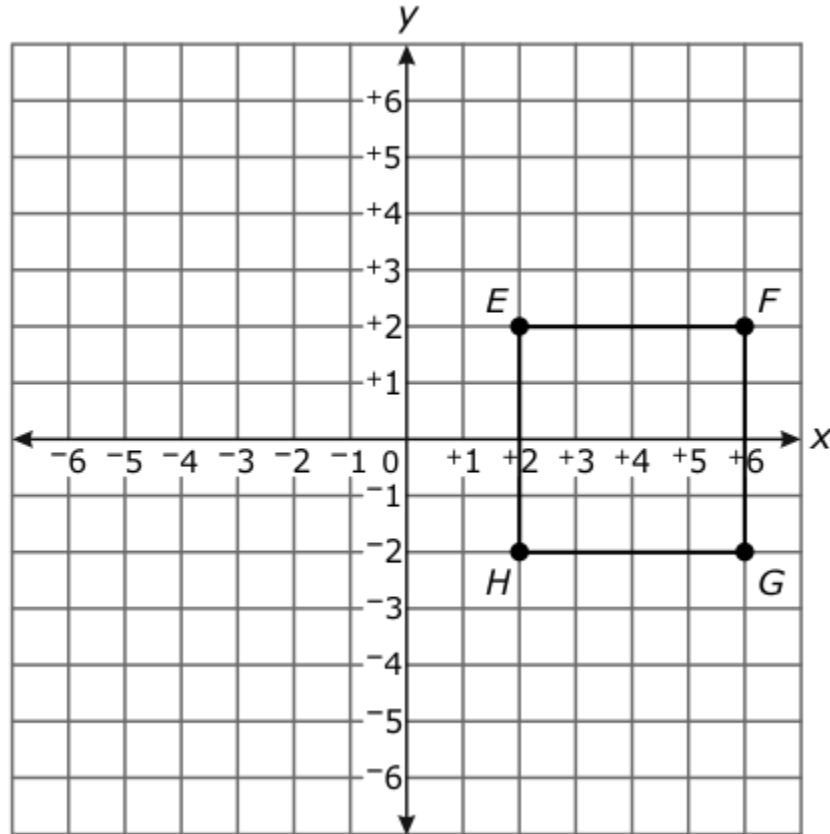
22. Triangle  $JKL$  will be dilated by a scale factor of 2 with the origin as the center of dilation.



What are the vertices of triangle  $J'K'L'$ ?

- A  $J'(-1, 3)$ ,  $K'(1, 5)$ ,  $L'(3, 1)$
- B  $J'(-6, 2)$ ,  $K'(-2, 6)$ ,  $L'(2, -2)$
- C  $J'(-6, 1)$ ,  $K'(-2, 3)$ ,  $L'(2, -1)$

23. Square  $EFGH$  will be dilated by a scale factor of  $\frac{1}{2}$ .

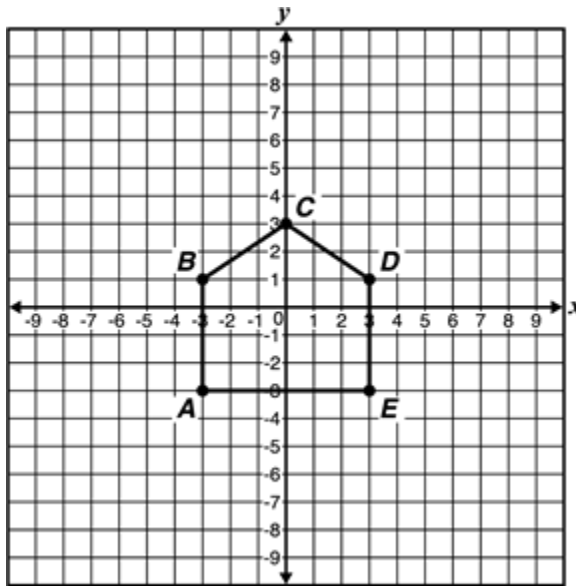


What will be the coordinates of  $G'$ ?

- A  $(3, -1)$
- B  $(3, -2)$
- C  $(12, -4)$



24. Pentagon  $ABCDE$  is dilated about the origin by a scale factor of 2.5.



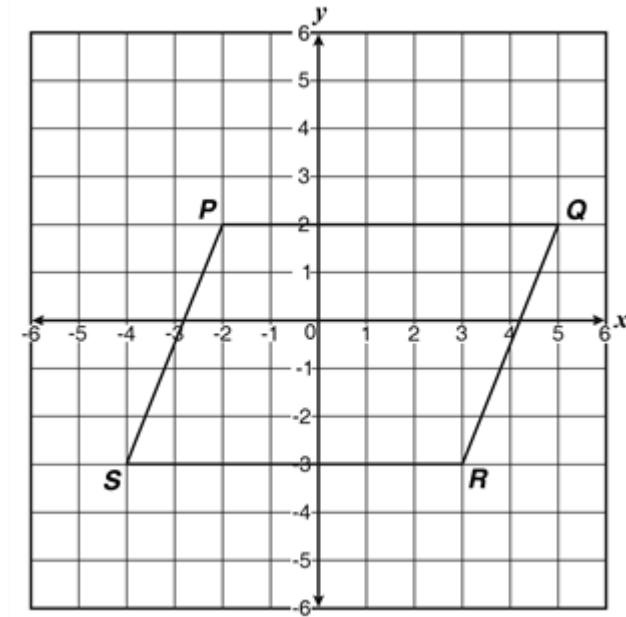
Which statement is FALSE?

- A Pentagon  $ABCDE$  is similar to  $A'B'C'D'E'$ .
- B Both pentagons have the same lines of symmetry.
- C The lengths of corresponding sides of the pentagons are in a ratio of 2:5.
- D The area of the dilated pentagon is 2.5 times the area of the original pentagon.

25. Triangle  $EFG$  has vertices  $E(-3, 4)$ ,  $F(-3, -2)$ , and  $G(5, -2)$ . After a dilation is applied, the image triangle  $E'F'G'$  has vertices  $E'(-9, 12)$ ,  $F'(-9, -6)$ , and  $G'(15, -6)$ . What is the scale factor for the dilation?

- A 2
- B 3
- C 4
- D 5

26. The diagram shows Quadrilateral  $PQRS$  on a coordinate plane.



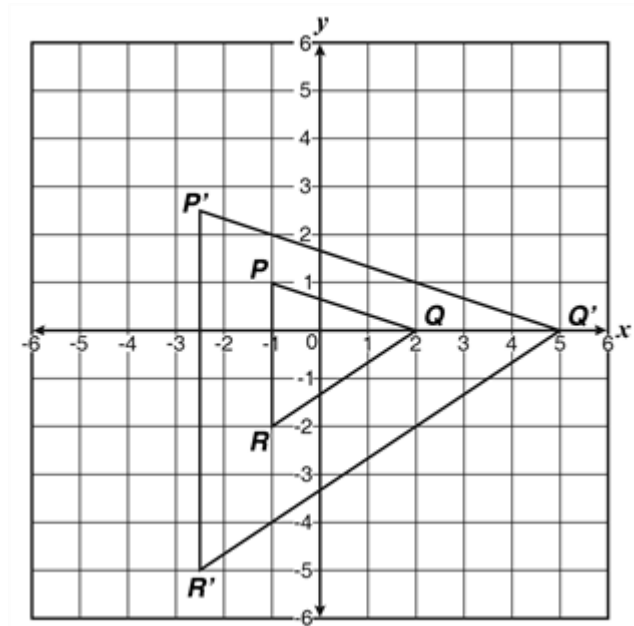
If Quadrilateral  $P'Q'R'S'$  is the result of the transformation described by  $(x, y) \rightarrow (0.5x, 0.5y)$ , what are the coordinates of Point  $S'$ ?

- A  $(-2, -3)$
- B  $(-2, -1.5)$
- C  $(-3.5, -2.5)$
- D  $(-4.5, -3.5)$

27. The vertices of a triangle are located at  $(0, 4)$ ,  $(-2, 0)$ , and  $(1, 0)$ . The triangle will be dilated by a scale factor of 0.5. What will be the coordinates of the vertices of the image triangle?

- A  $(0.5, 2), (-1, 0), (0, 0)$
- B  $(0, 2), (-1, 0), (0.5, 0)$
- C  $(0, 2), (1, 0), (5, 0)$
- D  $(0, 8), (-4, 0), (2, 0)$

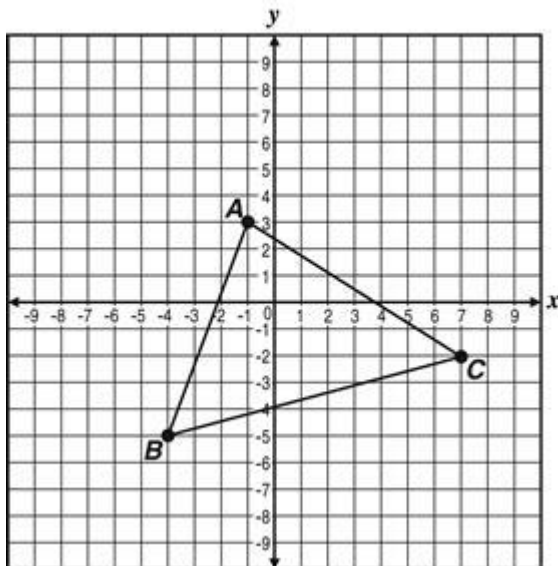
28. In the diagram below, Triangle  $P'Q'R'$  is the result of a transformation of Triangle  $PQR$ .



Which algebraic representation BEST describes this transformation?

- A  $(x, y) \rightarrow \left(\frac{5}{2}x, y\right)$
- B  $(x, y) \rightarrow \left(-\frac{5}{2}x, y\right)$
- C  $(x, y) \rightarrow \left(\frac{5}{2}x, \frac{5}{2}y\right)$
- D  $(x, y) \rightarrow \left(-\frac{5}{2}x, -\frac{5}{2}y\right)$

29. Triangle  $ABC$  is dilated about the origin with a scale factor of 3.



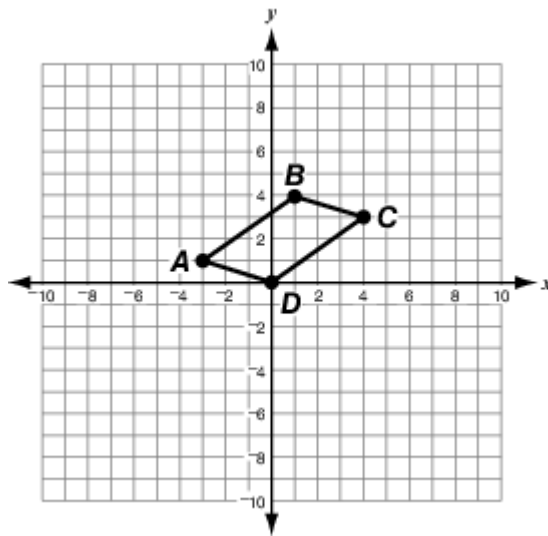
In triangle  $A'B'C'$ , what will be the coordinates of point  $B'$ ?

- A  $(-12, -15)$
- B  $(-8, -10)$
- C  $(-3, 9)$
- D  $(-2, -\frac{5}{2})$

30. The vertices of a square are  $W(3, 3)$ ,  $X(3, -3)$ ,  $Y(-3, -3)$ , and  $Z(-3, 3)$ . The square will be dilated using a scale factor of 2. What will be the coordinates of the image?

- A  $W'(1.5, 1.5)$ ,  $X'(1.5, -1.5)$ ,  $Y'(-1.5, -1.5)$ ,  $Z'(-1.5, 1.5)$
- B  $W'(5, 5)$ ,  $X'(5, -5)$ ,  $Y'(-5, -5)$ ,  $Z'(-5, 5)$
- C  $W'(6, 6)$ ,  $X'(6, -6)$ ,  $Y'(-6, -6)$ ,  $Z'(-6, 6)$
- D  $W'(9, 9)$ ,  $X'(9, -9)$ ,  $Y'(-9, -9)$ ,  $Z'(-9, 9)$

**31.** Parallelogram  $ABCD$ , shown on the coordinate grid below, is dilated by a scale factor 4, centered at the origin. What are the vertex coordinates of the dilated figure?



- A**  $A'(-2, 4)$ ,  $B'(4, 16)$ ,  $C'(16, 12)$ ,  $D'(0,0)$
- B**  $A'(4, -12)$ ,  $B'(16, 4)$ ,  $C'(12, 16)$ ,  $D'(0,0)$
- C**  $A'(12, -4)$ ,  $B'(-4, -16)$ ,  $C'(-16, -12)$ ,  $D'(0,0)$
- D**  $A'(-4, 12)$ ,  $B'(-16, -4)$ ,  $C'(-12, -16)$ ,  $D'(0,0)$

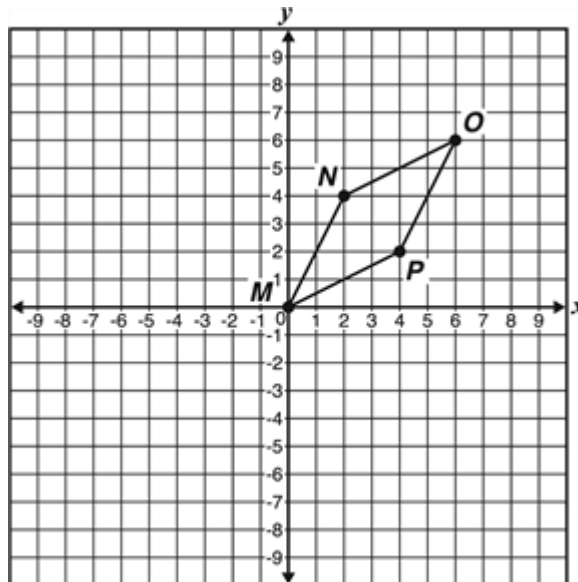
**32.** Nikki drew  $\overline{KM}$  on a coordinate plane, with Point  $K$  located at  $(4, 5)$  and Point  $M$  located at  $(2, -3)$ . Then she drew  $\overline{K'M'}$ , the result of the transformation of  $\overline{KM}$  described by  $(x, y) \rightarrow (4x, 4y)$ . What are the coordinates of Point  $K'$ ?

- A**  $(8, 9)$
- B**  $(8, 20)$
- C**  $(16, 9)$
- D**  $(16, 20)$

**33.** Parallelogram  $JKLM$  has coordinates  $J(-2, -1)$ ,  $K(0, 2)$ ,  $L(4, 2)$  and  $M(2, -1)$ . The image was dilated by a scale factor of 0.25. What are the coordinates of the image?

- A**  $J'(-1, -0.5)$ ,  $K'(0, 1)$ ,  $L'(2, 1)$ ,  $M'(1, -0.5)$
- B**  $J'(-0.5, -0.25)$ ,  $K'(0, 0.5)$ ,  $L'(1, 0.5)$ ,  $M'(0.5, -0.25)$
- C**  $J'(-0.5, 0.25)$ ,  $K'(0, 0.5)$ ,  $L'(1, 0.5)$ ,  $M'(0.5, 0.25)$
- D**  $J'(1, 0.5)$ ,  $K'(0, 1)$ ,  $L'(0.5, 1)$ ,  $M'(2, 1)$

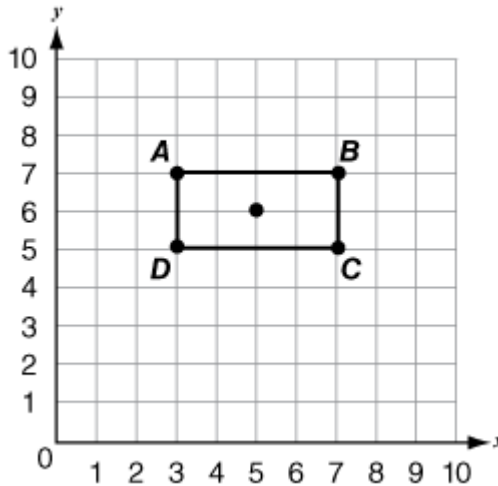
**34.** Rhombus  $MNOP$  is dilated by a factor of  $\frac{1}{2}$  about the origin to form  $M'N'O'P'$ .



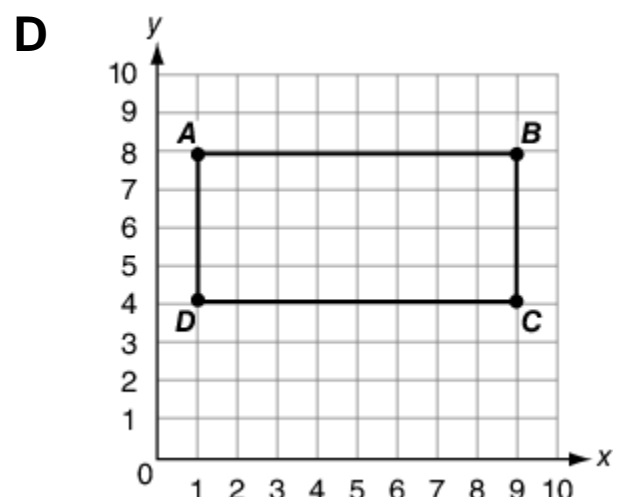
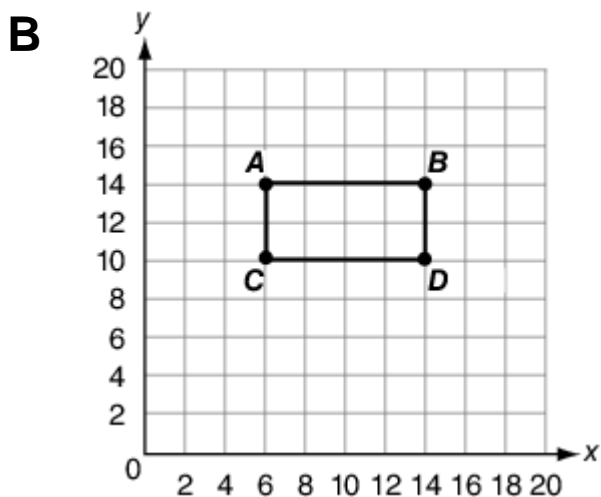
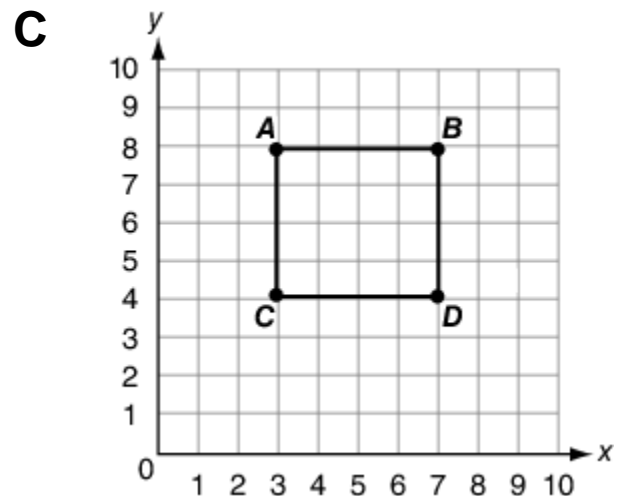
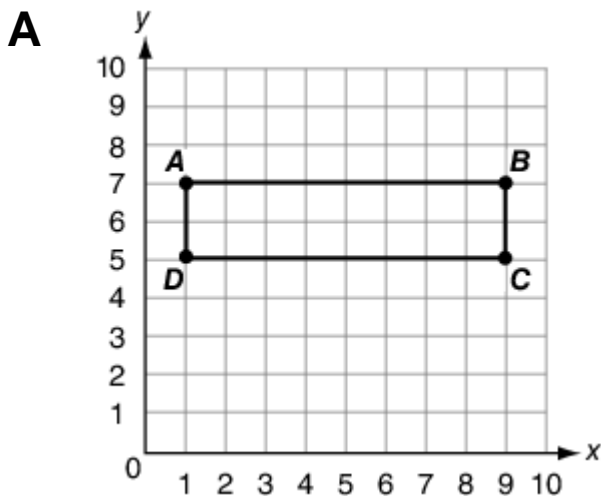
Which statement is FALSE?

- A**  $M'N'O'P'$  has 4 vertices.
- B**  $M'N'O'P'$  has 4 congruent sides.
- C**  $M'N'$  is greater in length than  $MN$ .
- D** The ratios  $MN:M'N'$  and  $NO:N'O'$  are equal.

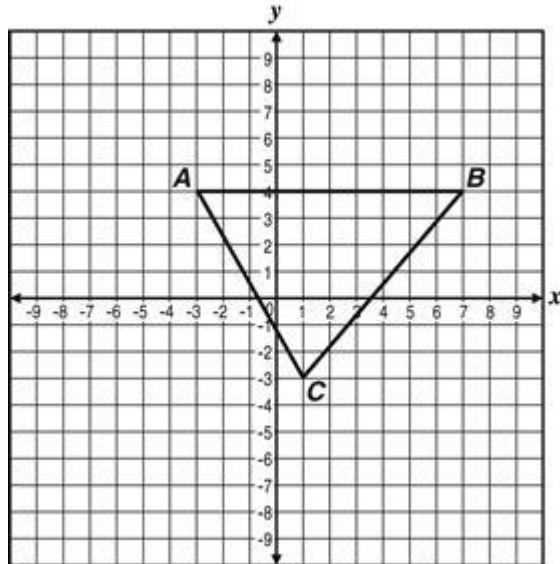
35. Rectangle  $ABCD$  is shown on a coordinate plane below.



Which rectangle represents dilation by a scale factor of 2 from the rectangle's center?



36. Triangle  $ABC$  is shown below.



If Triangle  $ABC$  is dilated about the origin with a scale factor of 2 into Triangle  $A'B'C'$ , what will be the coordinates of Point  $C'$ ?

- A  $(-6, 8)$
- B  $(1, -3)$
- C  $(2, -6)$
- D  $(14, 8)$



# KEY

1	B	14	B	25	B
2	C	13	A	26	B
3	B	19	C	27	B
4	A	15	A	28	C
5	D	16	B	29	A
6	B	18	D	30	C
7	A	17	A	31	A
8	A	20	B	32	D
9	D	21	A	33	B
10	D	22	B	34	C
11	B	23	A	35	D
12	A	24	D	36	C