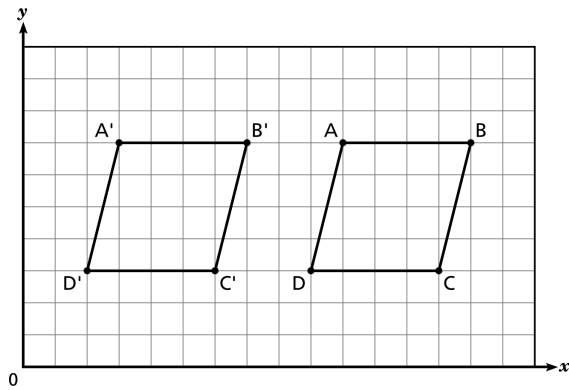


# Reflections and Translations

Name: \_\_\_\_\_

Date: \_\_\_\_\_

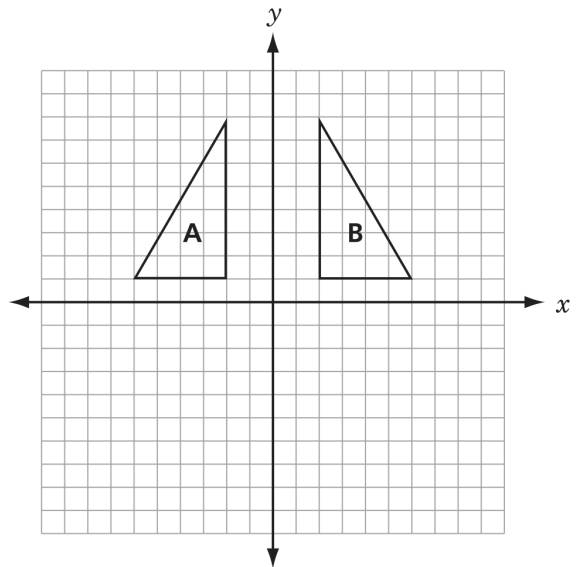
1. Parallelogram  $ABCD$  was translated to parallelogram  $A'B'C'D'$ .



How many units and in which direction were the  $x$ -coordinates of parallelogram  $ABCD$  moved?

- A. 3 units to the right    B. 3 units to the left  
C. 7 units to the right    D. 7 units to the left

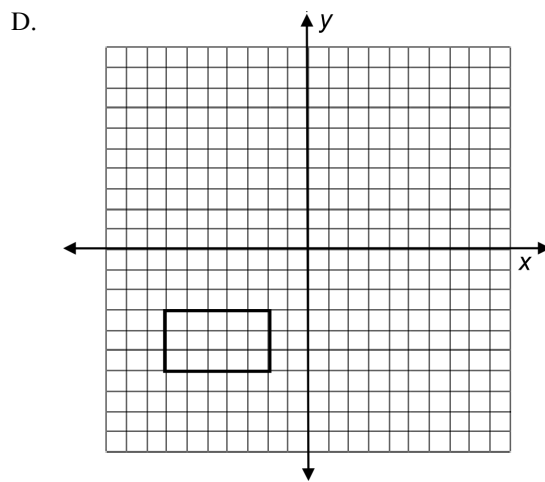
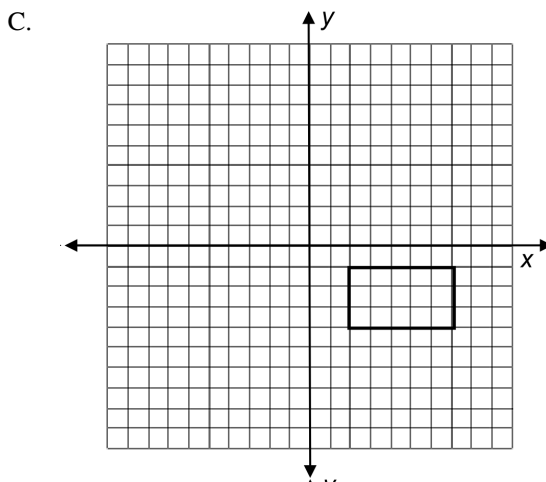
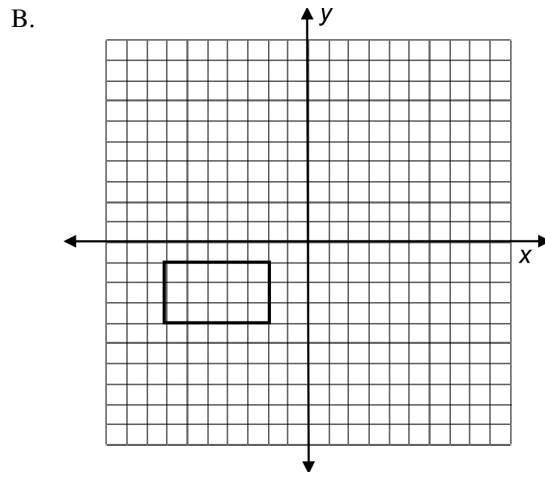
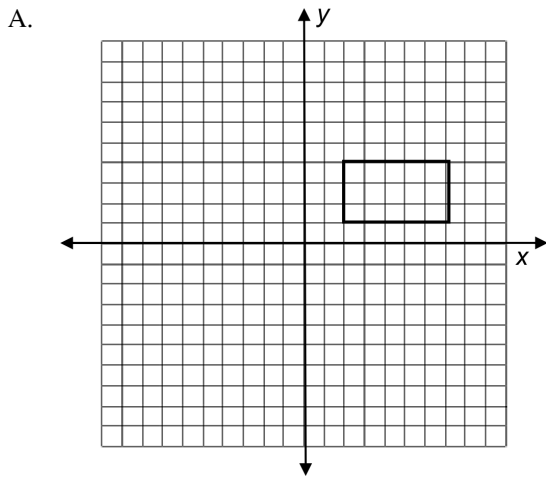
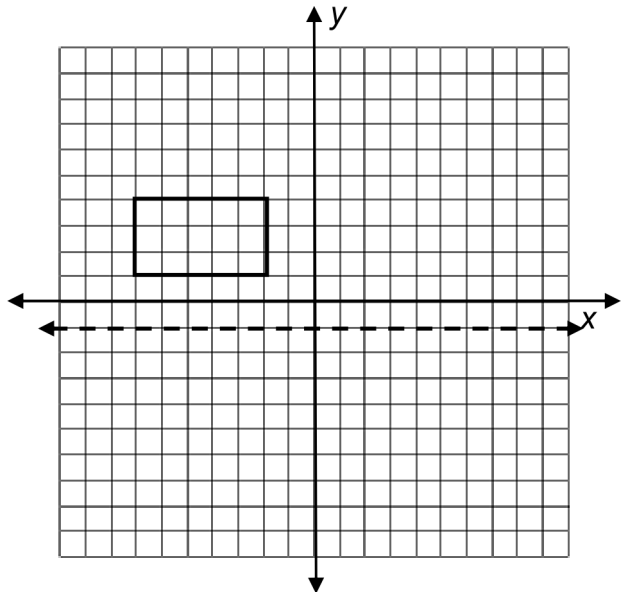
2. Alyssa made the design shown below.



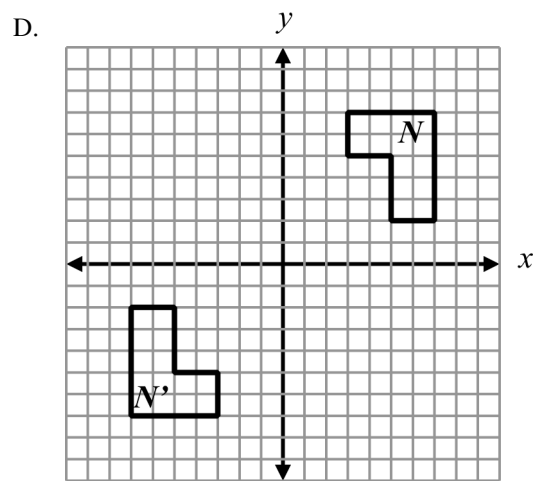
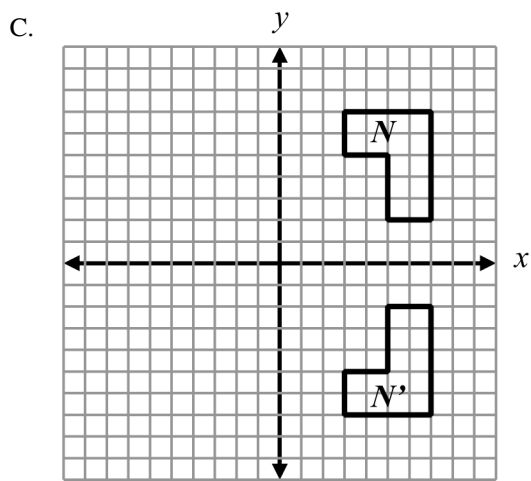
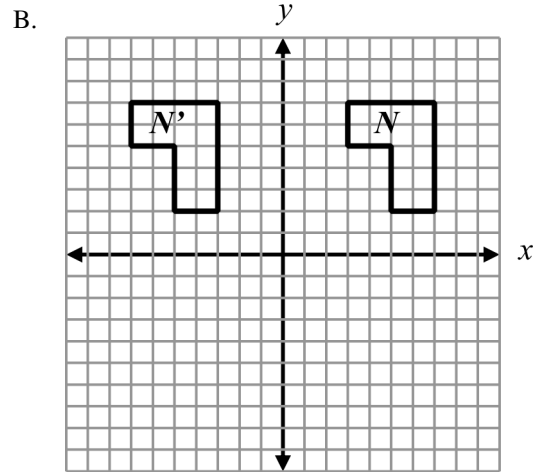
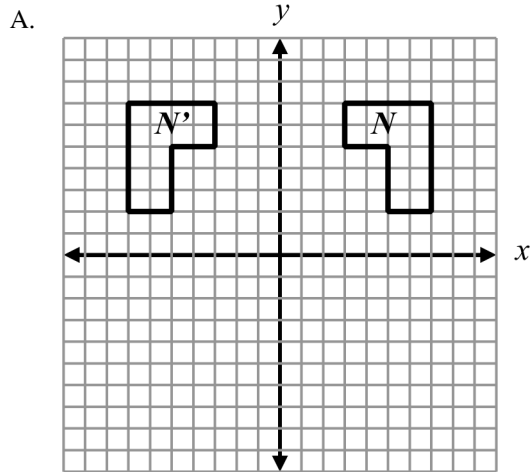
Which transformation could be used to show that figure A is congruent to figure B?

- A. add 5 to each  $x$ -coordinate  
B. multiply each  $y$ -coordinate by  $-1$   
C. multiply each  $x$ -coordinate by  $-1$   
D. rotate the figure 90 degrees about the origin

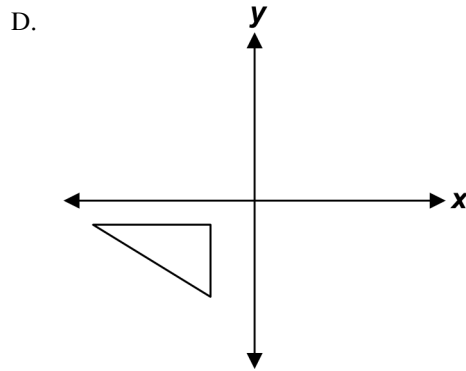
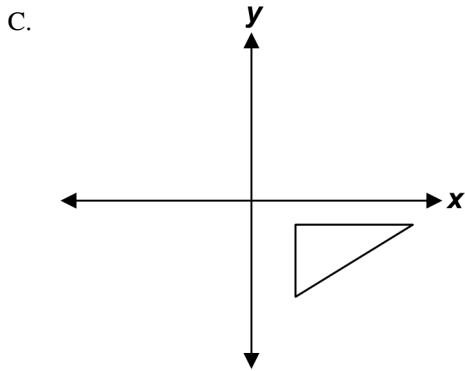
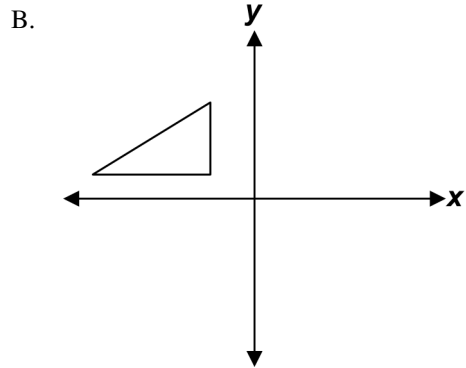
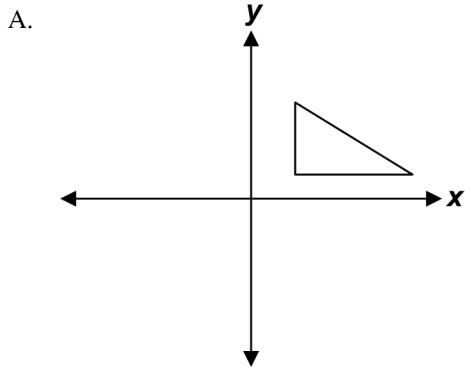
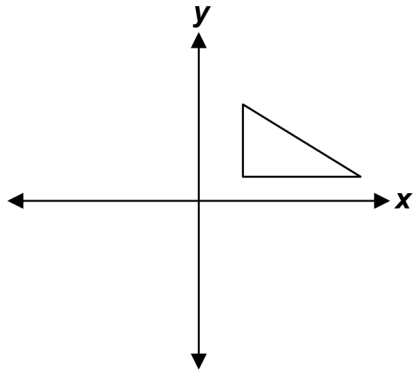
3. Which graph shows a reflection of the rectangle across the horizontal dotted line?



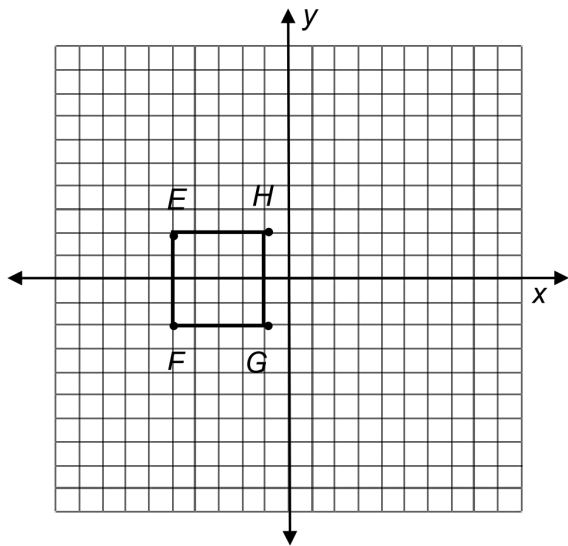
4. Which of the following is a single reflection of figure  $N$  over the  $y$ -axis to form  $N'$ ?



5. Which figure shows the triangle below reflected over the  $x$ -axis, then reflected over the  $y$ -axis?



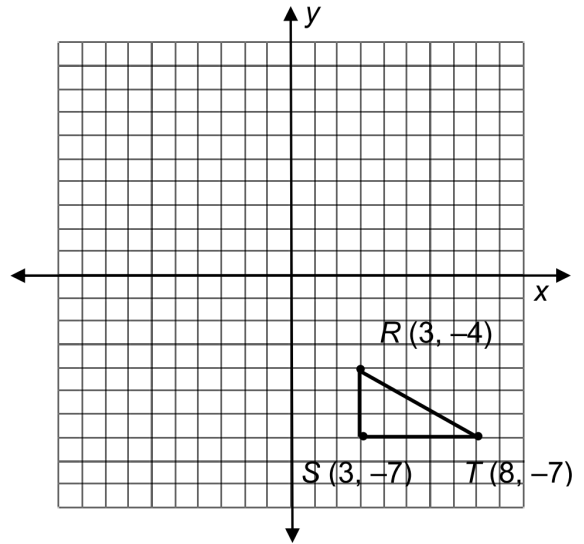
6. Figure  $EFGH$  in the coordinate plane has vertices at  $(-5, 2)$ ,  $(-5, -2)$ ,  $(-1, -2)$ , and  $(-1, 2)$ .



If the figure is translated 5 units to the right and 2 units up, what are the coordinates of the  $E'F'G'H'$ ?

- A.  $(0, 4)$ ,  $(0, 0)$ ,  $(4, 0)$ ,  $(4, 4)$
- B.  $(-3, 7)$ ,  $(-3, 3)$ ,  $(1, 3)$ ,  $(1, 7)$
- C.  $(-10, 0)$ ,  $(-10, 4)$ ,  $(-6, -4)$ ,  $(-6, 0)$
- D.  $(-7, -3)$ ,  $(-7, -7)$ ,  $(-3, -7)$ ,  $(-3, -3)$

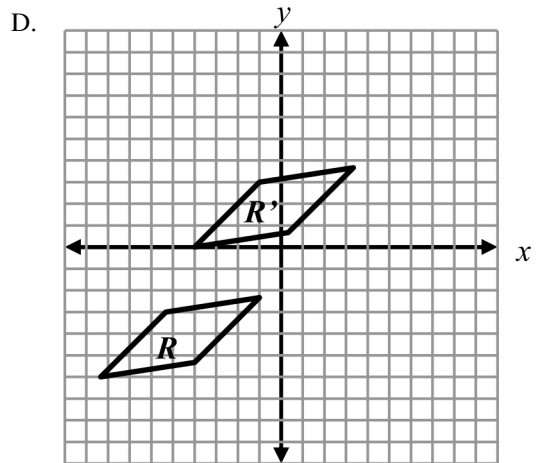
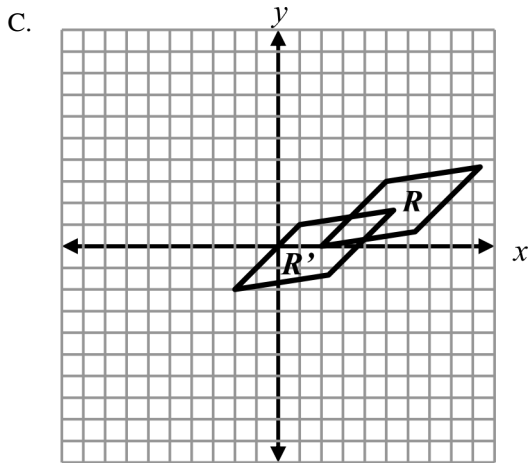
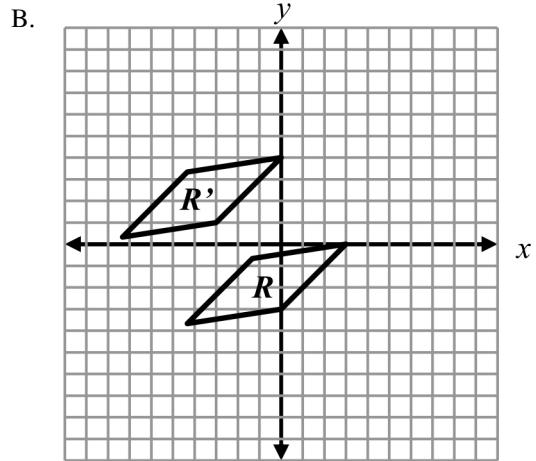
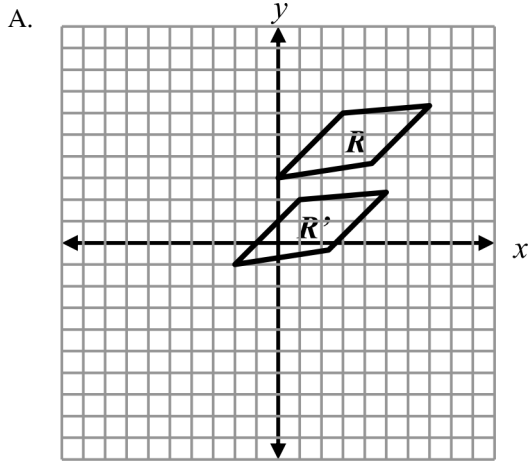
7. Triangle  $RST$  is shown in the coordinate plane.



What are the coordinates of  $R'S'T'$  if the figure is reflected over the  $x$ -axis and translated down two units?

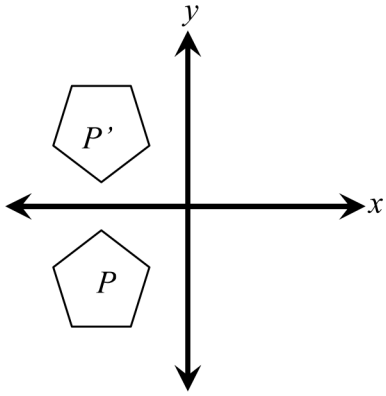
- A.  $(1, -6)$ ,  $(1, -9)$ ,  $(6, -9)$
- B.  $(3, 4)$ ,  $(3, 7)$ ,  $(8, 7)$
- C.  $(1, 2)$ ,  $(1, 5)$ ,  $(6, 5)$
- D.  $(3, 2)$ ,  $(3, 5)$ ,  $(8, 5)$

8. A figure on the graph is translated down 4 units and left 2 units. Which of the following represents this single transformation?

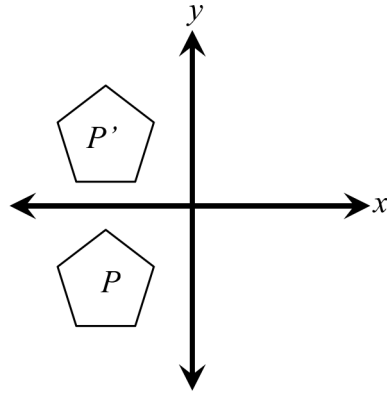


9. Which figure is a reflection of figure  $P$  in respect to the  $x$ -axis?

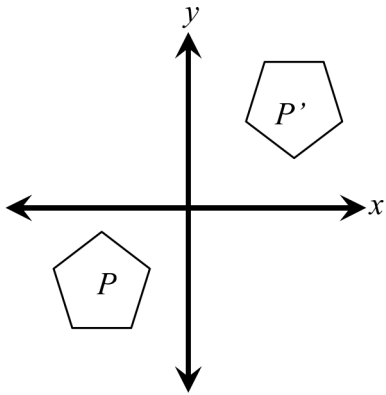
A.



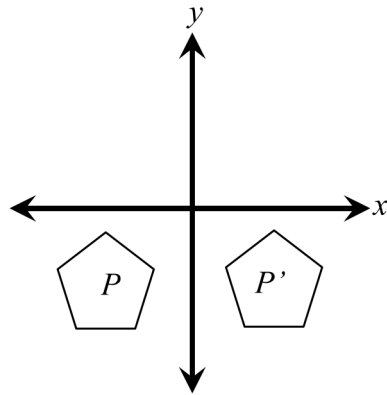
B.



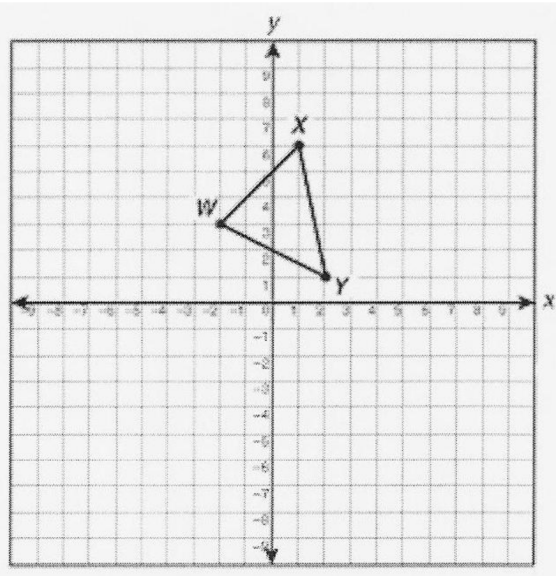
C.



D.

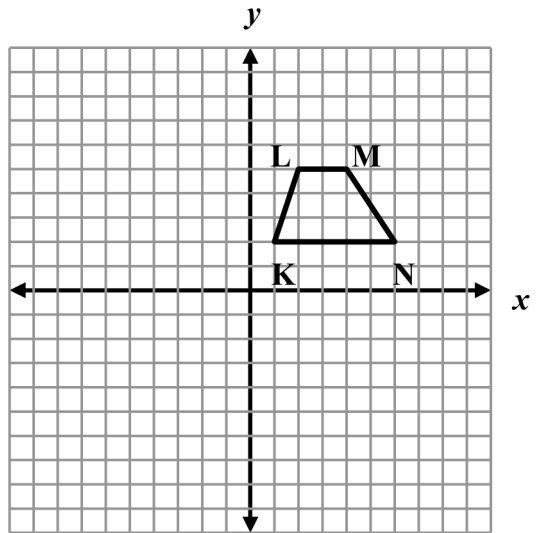


10. What is the apparent image of  $X$  when triangle  $WXY$  is translated 2 units down and 5 units right?



- A. (1, 3)   B. (3, 1)   C. (4, 6)   D. (6, 4)

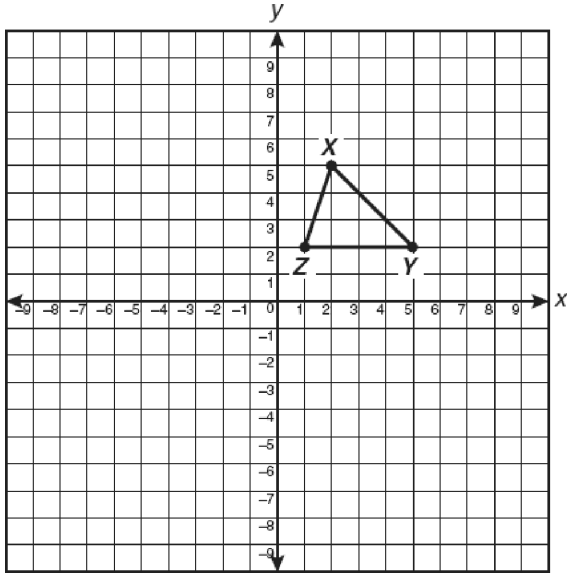
11. If trapezoid  $KLMN$  shown below is reflected across the  $x$ -axis to form trapezoid  $K'L'M'N'$ , what are the apparent coordinates of  $M'$ ?



- A.  $(-4, 5)$                       B.  $(-4, -5)$   
C.  $(4, -5)$                       D.  $(4, 5)$



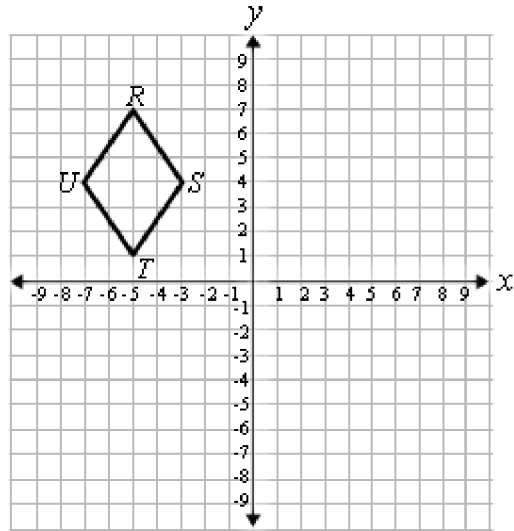
12.  $\triangle XYZ$  is translated 3 units to the right and 2 units down.



What will be the apparent coordinates of the image of point  $X$ ?

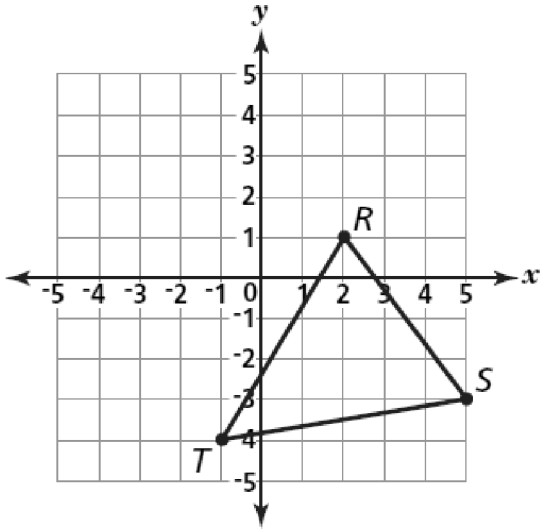
- A. (0, 8)    B. (3, 5)    C. (5, 3)    D. (8, 0)

13. What is the image of  $R$  when  $RSTU$  is translated 3 units down and 6 units right?



- A. (-1, 1)                      B. (1, -1)  
 C. (1, 4)                        D. (4, 1)

14. Study  $\triangle RST$  on the grid below.



When  $\triangle RST$  is translated 4 units down, what are the apparent coordinate of  $T'$ ?

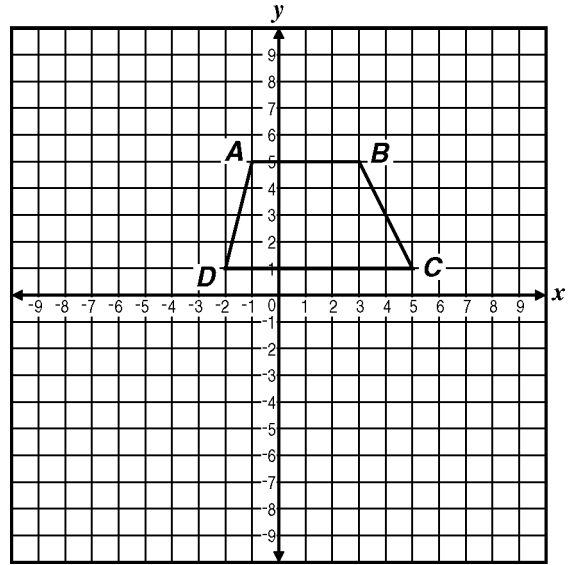
- A.  $(-8, -1)$                       B.  $(-4, -1)$   
 C.  $(-1, -8)$                         D.  $(0, -4)$

15. The vertices of  $\triangle ABC$  are  $A(2, 1)$ ,  $B(3, 4)$ , and  $C(1, 3)$ . If  $\triangle ABC$  is translated 1 unit down and 3 units to the left to create  $\triangle DEF$ , what are the coordinates of the vertices of  $\triangle DEF$ ?

- A.  $D(0, 1)$ ,  $E(1, 2)$ ,  $F(1, 3)$   
 B.  $D(0, -1)$ ,  $E(0, 3)$ ,  $F(-2, -2)$   
 C.  $D(-2, 2)$ ,  $E(0, 3)$ ,  $F(-1, 0)$   
 D.  $D(-1, 0)$ ,  $E(0, 3)$ ,  $F(-2, 2)$

16. Trapezoid  $ABCD$  below is to be translated to trapezoid  $A'B'C'D'$  by the following motion rule.

$$(x, y) \rightarrow (x + 3, y - 4)$$

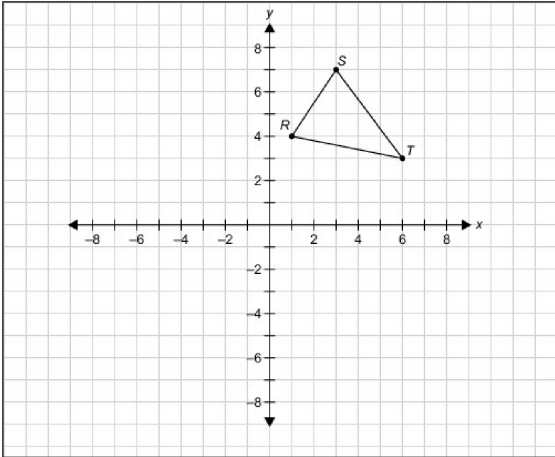


What will be the coordinates of vertex  $C'$ ?

- A.  $(1, -3)$                               B.  $(2, 1)$   
 C.  $(6, 1)$                                 D.  $(8, -3)$
17. Which expression describes the translation of a point from  $(-3, 4)$  to  $(4, -1)$

- A. 7 units left and 5 units up  
 B. 7 units right and 5 units up  
 C. 7 units left and 5 units down  
 D. 7 units right and 5 units down

18.

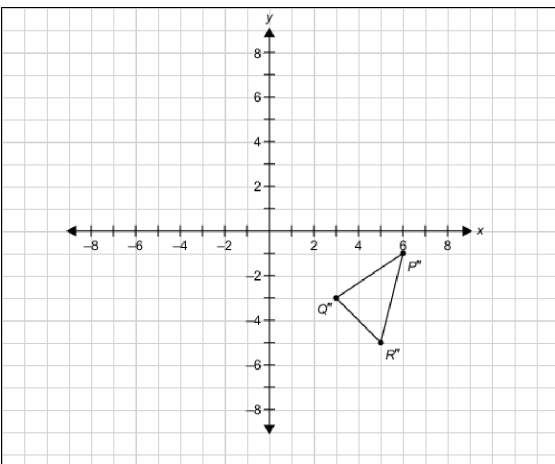


Triangle  $RST$  is shown. Triangle  $RST$  is translated 8 units to the left and 2 units down to create triangle  $R'S'T'$ .

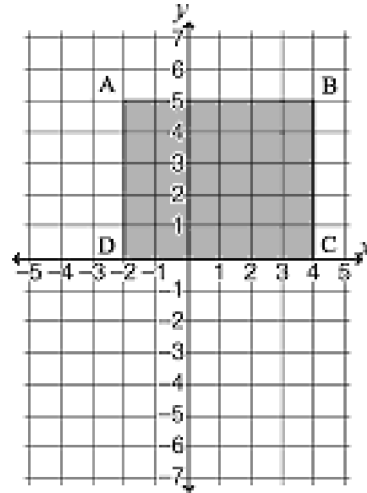
- a) Draw and label triangle  $R'S'T'$ .  
Then, triangle  $R'S'T'$  is reflected across the  $x$ -axis to create triangle  $R''S''T''$
- b) Draw and label triangle  $R''S''T''$

19. Triangle  $PQR$  was reflected over the  $x$ -axis and then translated 7 units to the right to create  $P''Q''R''$  as shown.

Draw original triangle  $PQR$  and label the vertices.

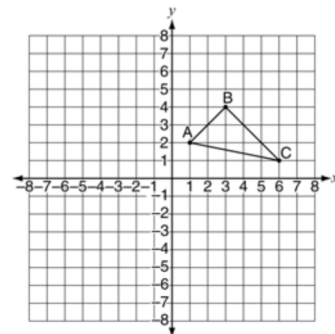


20. Use the diagram below to answer the question that follows.



What will be the coordinates of point A if figure ABCD is reflected across the  $x$ -axis?

21. Use the figure below to answer the question that follows.

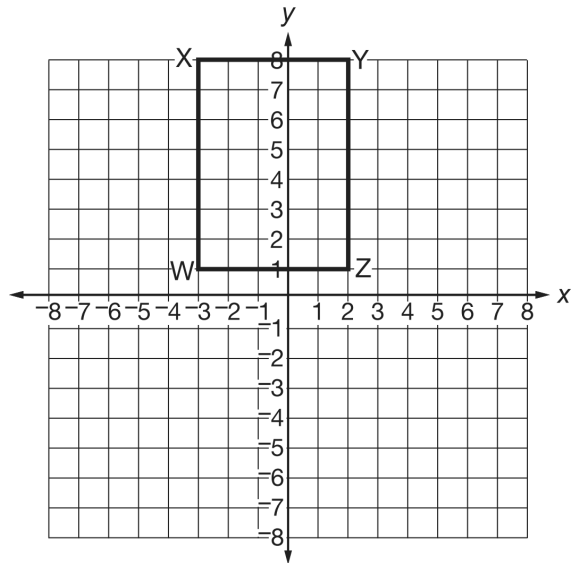


A graphic artist needs to reflect triangle ABC across the  $x$ -axis to create Figure  $A'B'C'$ . What are the coordinates of  $A'$ ?

- A.  $(1, -2)$
- B.  $(2, -1)$
- C.  $(-1, 2)$
- D.  $(-2, 1)$

22. Triangle ABC has the vertices  $A(2, 0)$ ,  $B(4, 2)$ , and  $C(3, 4)$ . Name the ordered pair of  $C'$  after a reflection across the  $x$ -axis.

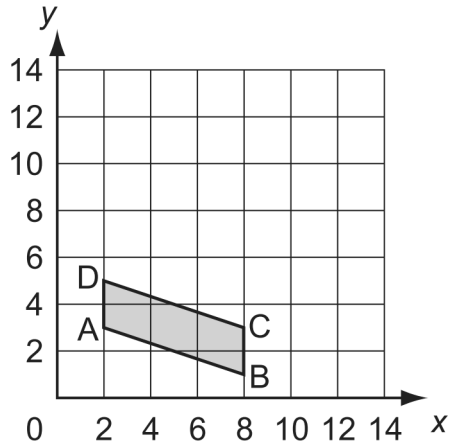
23. Use the graphic below to answer the question.



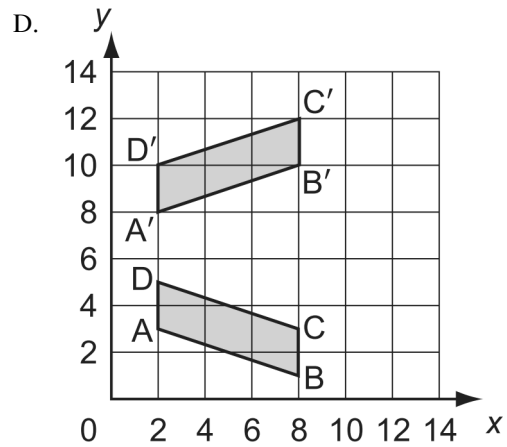
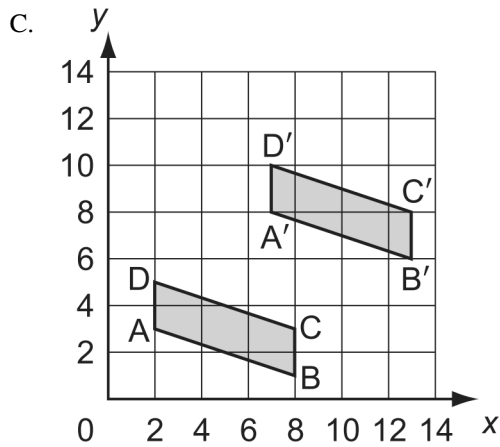
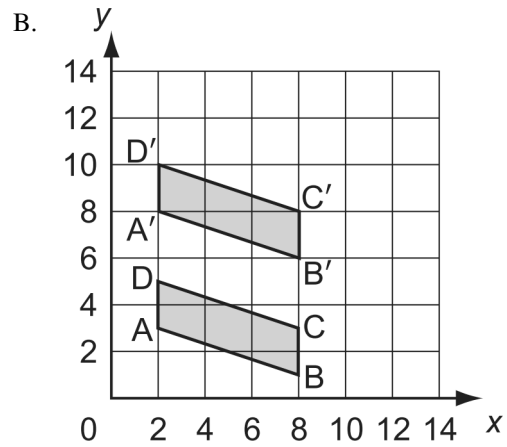
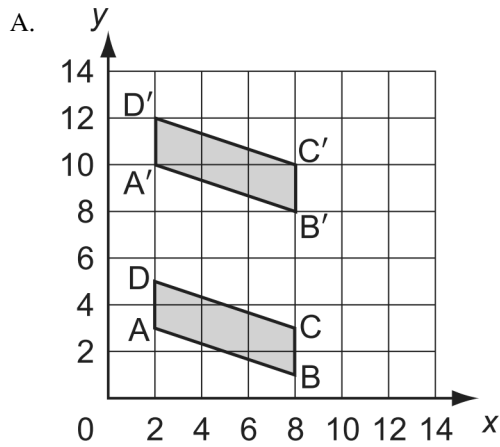
Rectangle  $WXYZ$  will be transformed so that  $W'$  is located at  $(-3, -1)$  and  $Z'$  is located at  $(2, -1)$ . Which could be the coordinates of  $X'$  and  $Y'$  so that  $W'X'Y'Z'$  is congruent to  $WXYZ$ ?

- A.  $X'$  is located at  $(-3, -6)$  and  $Y'$  is located at  $(2, -6)$
- B.  $X'$  is located at  $(3, 8)$  and  $Y'$  is located at  $(-2, 8)$
- C.  $X'$  is located at  $(-3, 6)$  and  $Y'$  is located at  $(2, 6)$
- D.  $X'$  is located at  $(2, -8)$  and  $Y'$  is located at  $(-3, -8)$

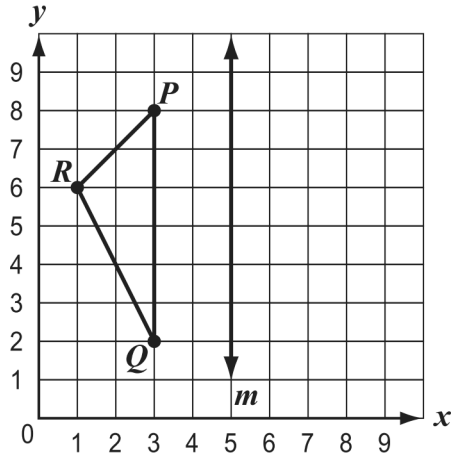
24. Zane graphed a parallelogram on the coordinate grid shown.



Zane then translated the parallelogram up 5 units. Which coordinate grid shows the figure after the translation?



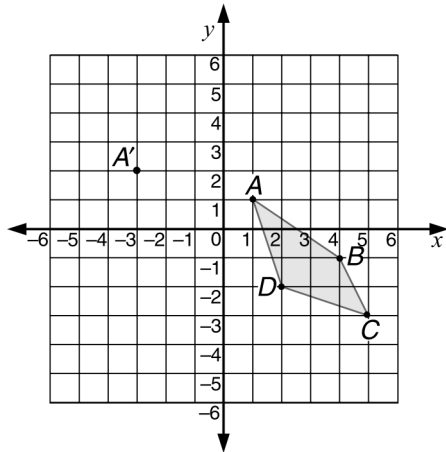
25. Sherry drew  $\triangle PQR$  and line  $m$ , as shown on the grid below.



Sherry will reflect  $\triangle PQR$  over line  $m$ . What will be the coordinates of the image of point  $R$  after  $\triangle PQR$  is reflected over line  $m$ ?

- A. (5, 6)    B. (6, 9)    C. (7, 6)    D. (9, 6)

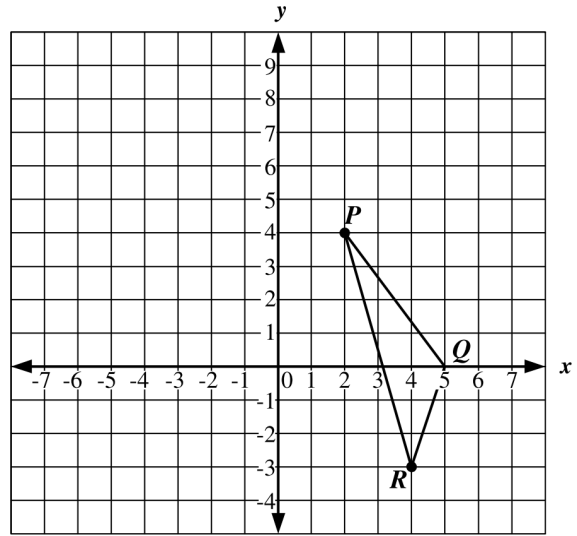
- 26.



If Figure  $ABCD$  is translated so that the image of  $A$  is  $A'$  at  $(-3, 2)$ , then the coordinates of the image of point  $B$  will be

- A. (0, 0).                      B. (-1, 4).  
C. (-2, -1).                    D. (-3, 1).

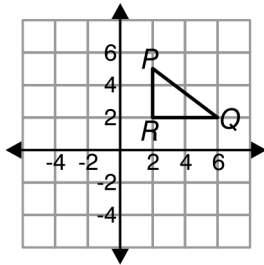
27. Isaac is going to draw  $\triangle STU$  on the grid shown below so that it is congruent to  $\triangle PQR$ .



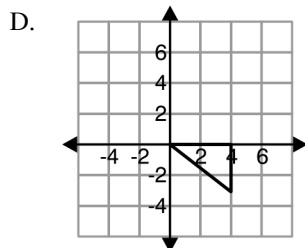
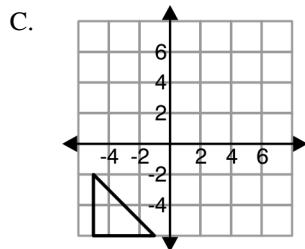
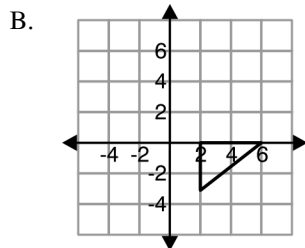
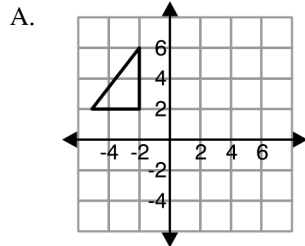
He located point  $S$  at  $(-1, 0)$  and point  $T$  at  $(-4, 4)$ . Which of the following coordinates represents a possible location for point  $U$ ?

- A. (-3, 6)                      B. (-3, 7)  
C. (-4, 3)                      D. (-4, 7)

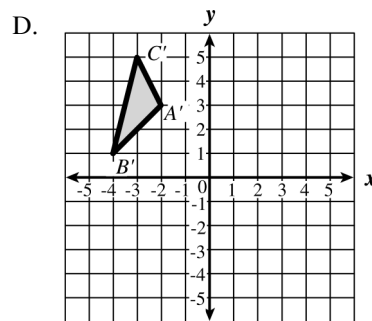
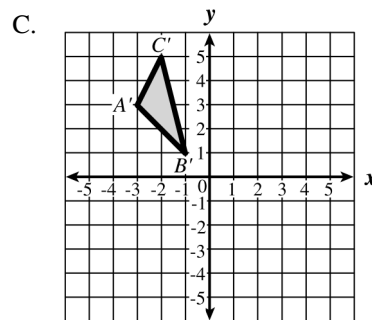
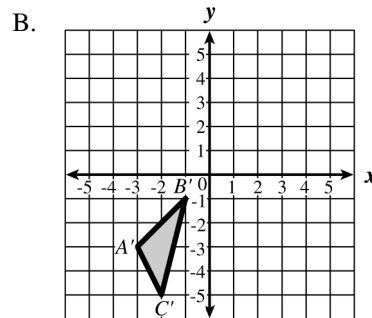
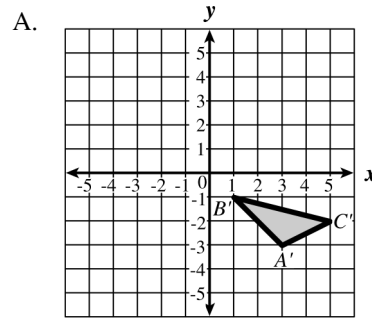
28. The diagram below shows  $\triangle PQR$  on a coordinate plane.



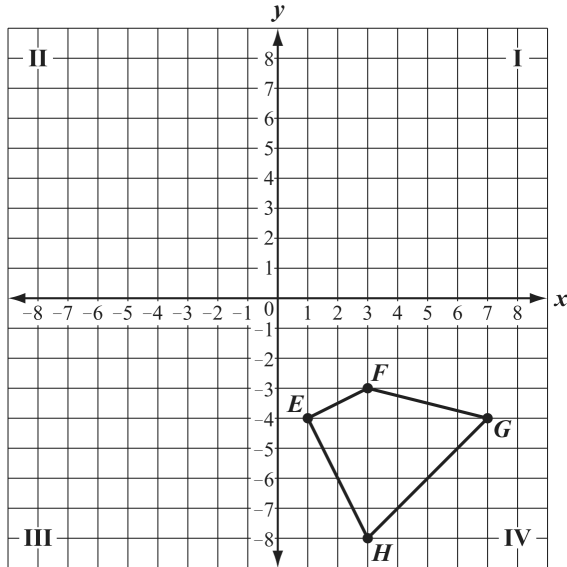
Which of the following is the result of a reflection of  $\triangle PQR$ ?



29. Triangle  $ABC$  has vertices at  $A(3, 3)$ ,  $B(1, 1)$ , and  $C(2, 5)$ . In which of the graphs below is triangle  $A'B'C'$  a reflection of triangle  $ABC$  over the  $y$ -axis?



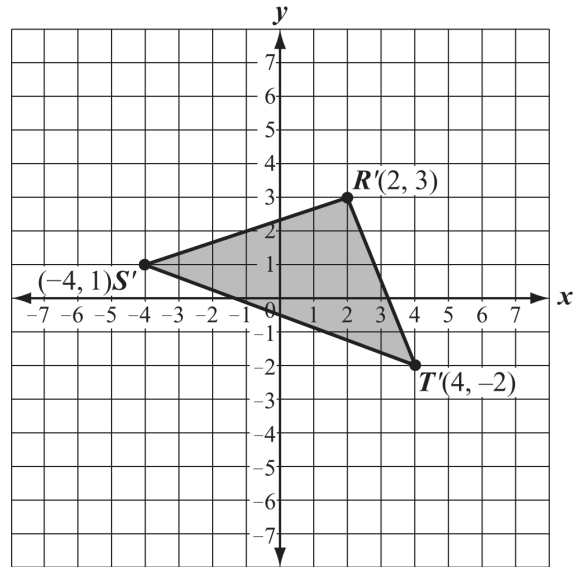
30. Quadrilateral  $EFGH$  is shown on the coordinate grid below.



The quadrilateral will be reflected over the  $y$ -axis. The reflected image will then be translated 2 units left and 7 units up. In which of the following quadrants will the final reflected and translated image lie?

- A. I and II                      B. II and III  
C. II and IV                      D. III and IV

31. Triangle  $R'S'T'$  is shown on the coordinate grid below.



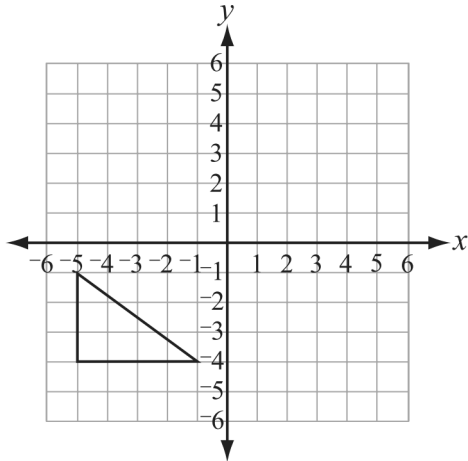
Triangle  $R'S'T'$  is the image of triangle  $RST$  after triangle  $RST$  was translated 3 units to the right and 4 units up.

What were the coordinates of point  $R$  before the translation?

- A. (6, 6)                          B. (5, 7)  
C. (-2, 0)                        D. (-1, -1)

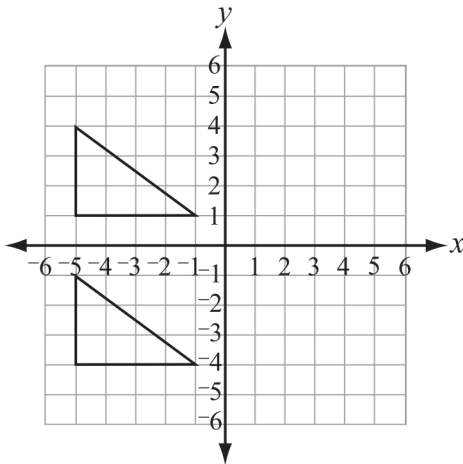


32. Joanne and Christopher are designing a quilt. They start by creating a triangle shape in the lower left quadrant as shown below.

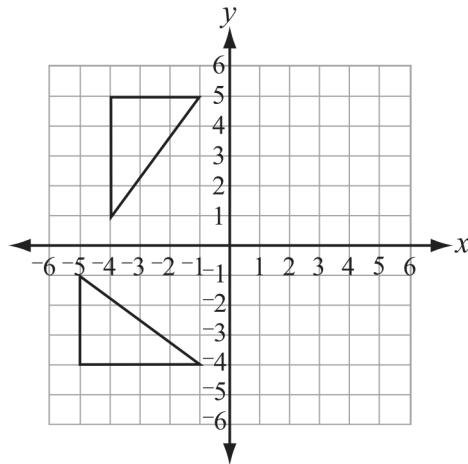


They transform it by rotating the triangle shown above  $90^\circ$  clockwise about the origin. What does the new design look like?

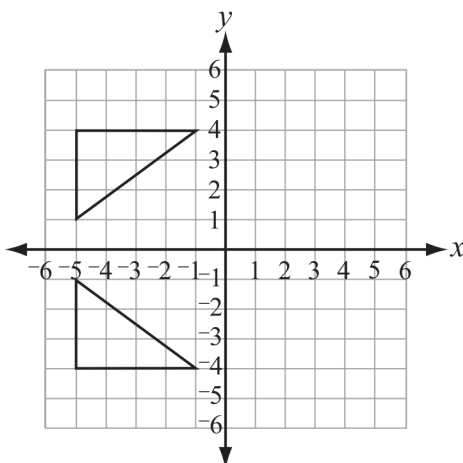
A.



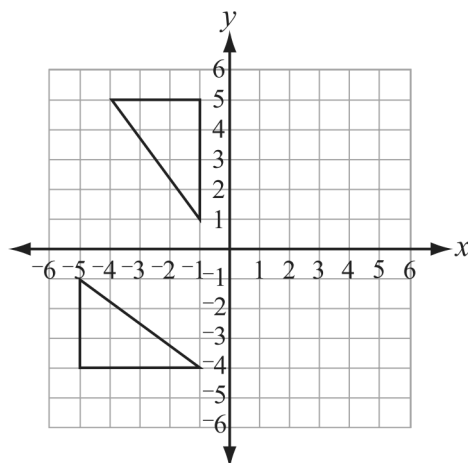
B.



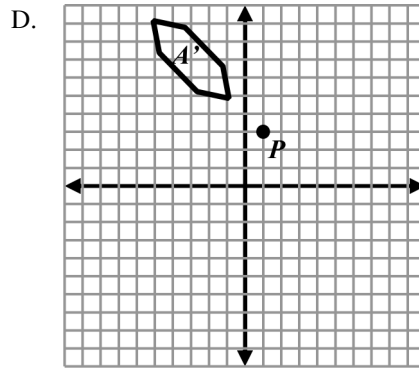
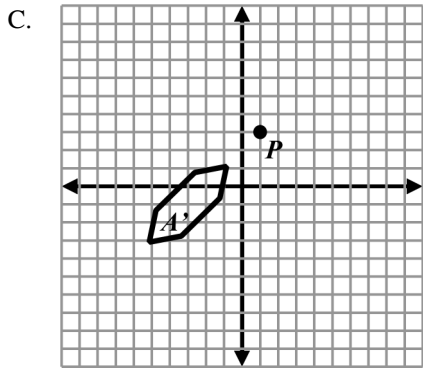
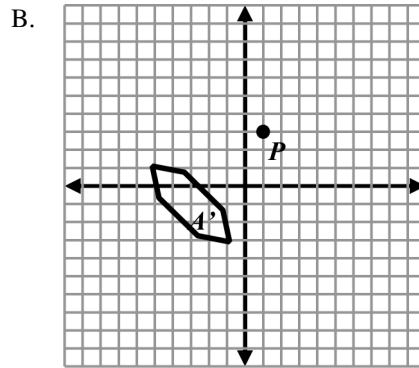
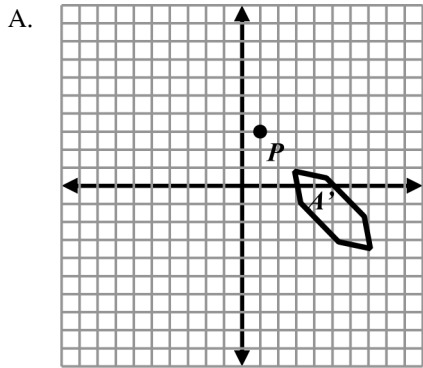
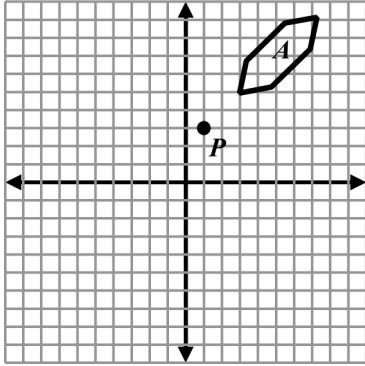
C.



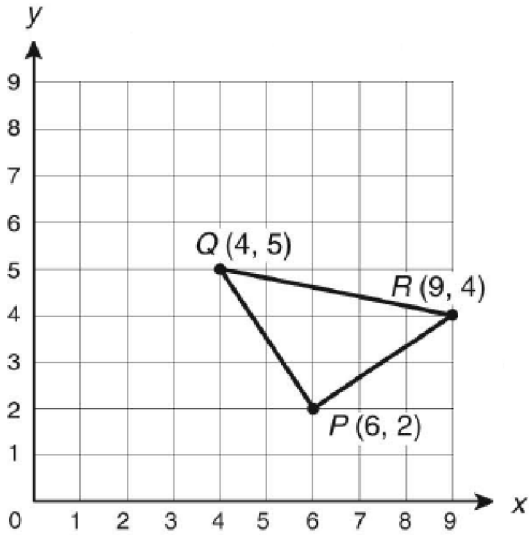
D.



33. Polygon  $A$  will be rotated counter-clockwise  $90^\circ$  about point  $P$  to form polygon  $A'$ .



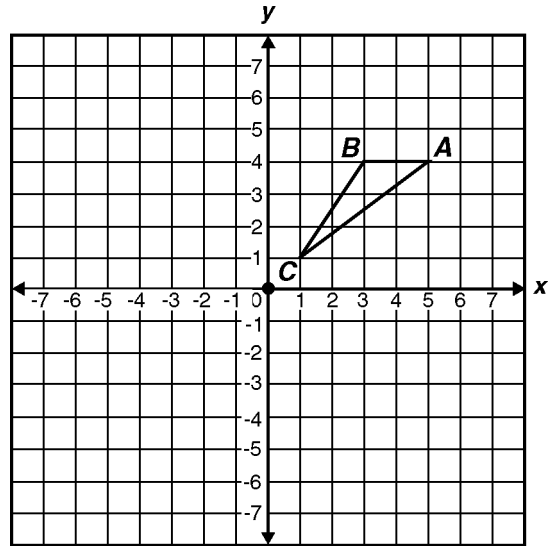
34. Triangle  $PQR$  is shown.



What are the coordinates of  $P'$  when  $\triangle PQR$  is dilated by a scale factor of 3 using the origin as the center?

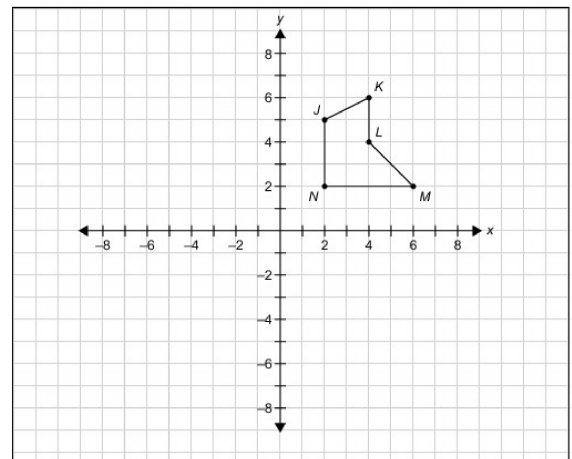
- A. (6, 18)                      B.  $(3, \frac{2}{3})$   
 C.  $(\frac{2}{3}, 3)$                       D. (18, 6)

35. If triangle  $ABC$  is rotated 180 degrees about the origin, what are the coordinates of  $A'$ ?



- A. (-5, -4)                      B. (-5, 4)  
 C. (-4, 5)                        D. (-4, -5)

36. Pentagon JKLMN is shown on the coordinate grid. The pentagon is rotated  $90^\circ$  counterclockwise about the origin to create pentagon  $J'K'L'M'N'$ .



Draw and label pentagon  $J'K'L'M'N'$ .

37. Figure  $LMNO$  is shown below.

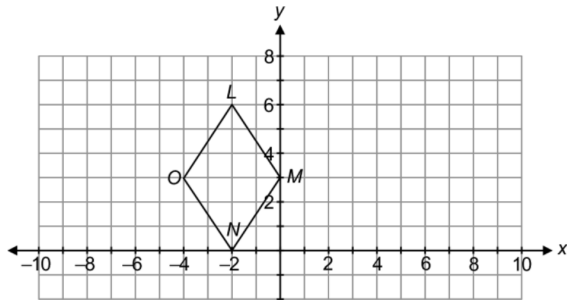
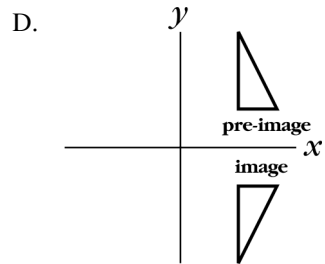
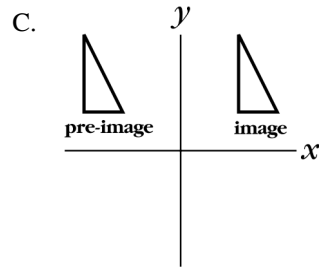
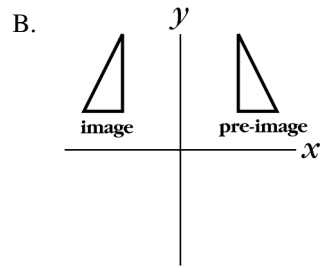
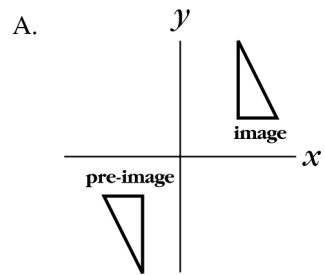


Figure  $L'M'N'O'$  will be created by rotating figure  $LMNO$   $90^\circ$  clockwise about point  $M$ .

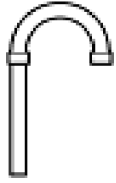
What will be the coordinates of point  $L'$  ?

- A. (0, 6)    B. (2, 6)    C. (3, 3)    D. (3, 5)

38. Which diagram below best shows a *rotation* of the pre-image to the image?



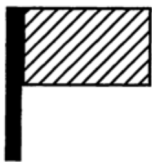
39. Larry used pieces of pipe to build this shape.



Which picture shows Larry's shape turned  $90^\circ$  counterclockwise?

- A. B.
- C. D.

40.



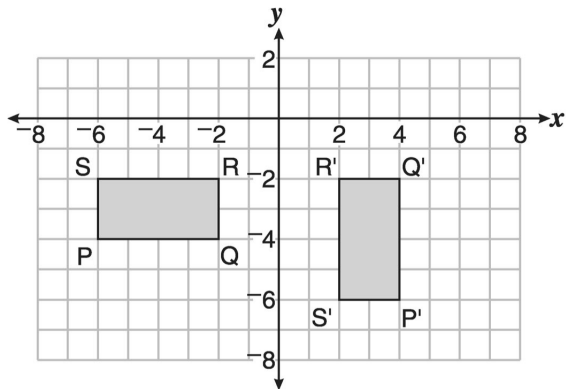
Which of the following shows the flag above turned  $90^\circ$  clockwise?

- A. B.
- C. D.

41. Which of the diagrams below best shows a translation of  $(-4)$  units of the dark triangle?

- A.
- B.
- C.
- D.

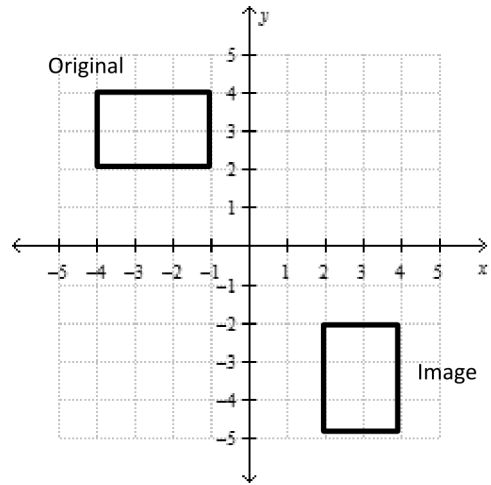
42. The figure below depicts a coordinate plane, rectangle PQRS, and the image of rectangle PQRS after a transformation. Point P' is the image of point P, Q' is the image of Q, R' is the image of R, and S' is the image of S.



Which transformation produced the image P'Q'R'S'?

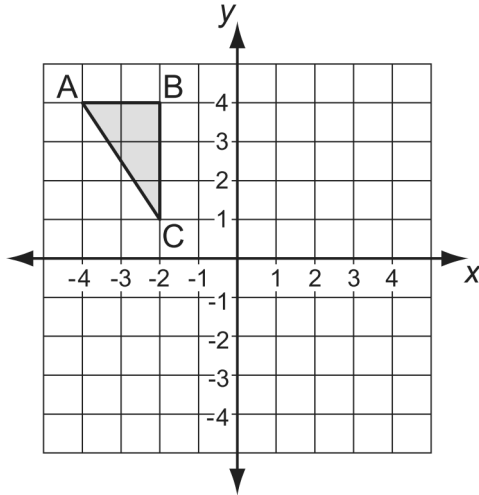
- A. a 180-degree counterclockwise rotation about the point (0, 0)
- B. a translation of four units to the right
- C. a 90-degree counterclockwise rotation about the point (0, 0)
- D. a reflection over the y-axis

43. Select all transformations from the list below that could transform the original to the image in the coordinate grid below?



- A. Rotate  $180^\circ$  about the origin.
- B. Rotate  $90^\circ$  clockwise about the origin, translate down 6 units
- C. Rotate  $90^\circ$  counterclockwise about the origin, translate down 6 units
- D. Rotate  $90^\circ$  counterclockwise about the origin, translate down 1 unit and right 6 units
- E. Rotate  $90^\circ$  counterclockwise about the origin, translate down 6 units and left 1 unit
- F. Rotate  $90^\circ$  counterclockwise about the origin, translate down 1 unit, reflect over the y-axis
- G. Rotate  $90^\circ$  clockwise about the origin, translate down 1 unit, reflect over the y-axis

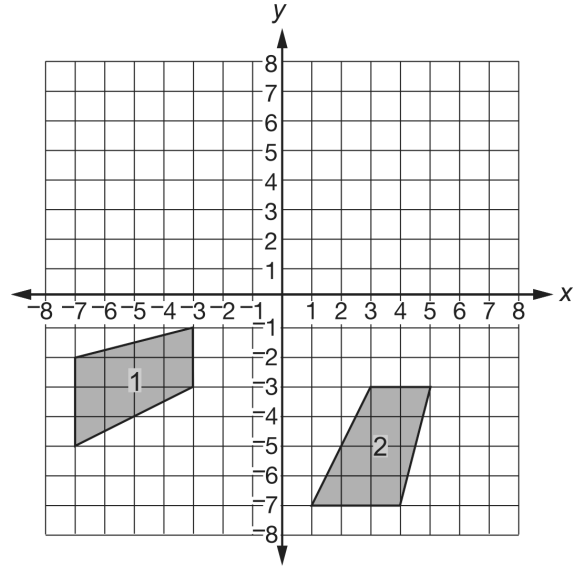
44. Janet graphed a triangle on the coordinate grid shown.



Janet rotated the triangle  $90^\circ$  clockwise about the origin to create figure  $A'B'C'$ . What are the coordinates of the vertices of the figure  $A'B'C'$  after the rotation?

- |    |              |    |            |
|----|--------------|----|------------|
| A. | $A'(-4, -4)$ | B. | $A'(4, 4)$ |
|    | $B'(-4, -2)$ |    | $B'(2, 4)$ |
|    | $C'(-1, -2)$ |    | $C'(2, 1)$ |
| C. | $A'(-4, -4)$ | D. | $A'(4, 4)$ |
|    | $B'(-2, -4)$ |    | $B'(4, 2)$ |
|    | $C'(-2, -1)$ |    | $C'(1, 2)$ |

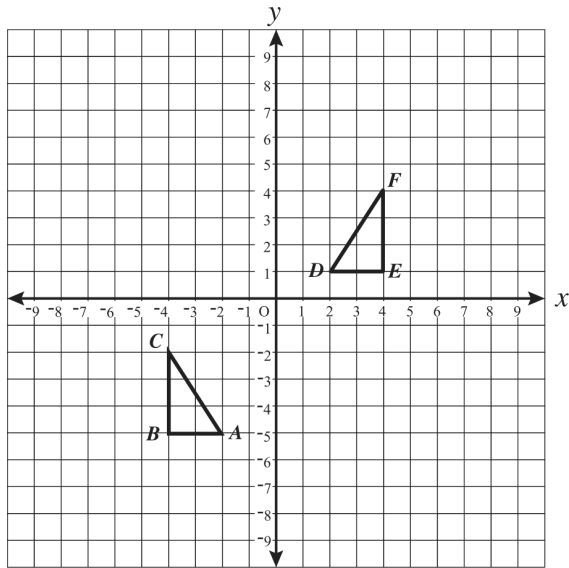
45. Use the graph to answer the question.



Which pair of transformations moves quadrilateral 1 to quadrilateral 2?

- reflect it over the line  $y = -3$ , then rotate it  $90^\circ$  counterclockwise about the origin
- reflect it over the  $x$ -axis, then rotate it  $180^\circ$  about the origin
- rotate it  $90^\circ$  counterclockwise about point  $(-3, -3)$ , then translate it 8 units to the right
- translate it 8 units to the right, then reflect it over the line  $y = -3$

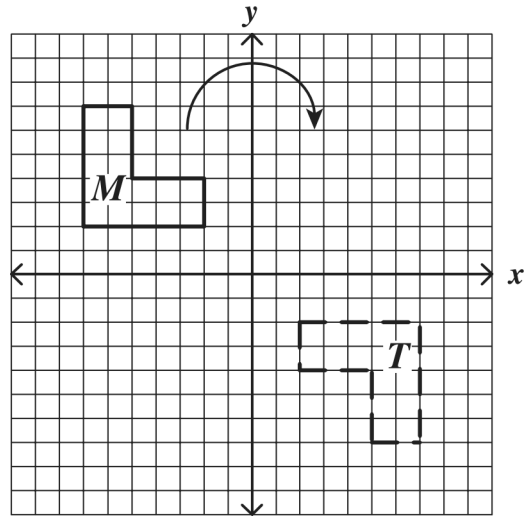
46.  $\triangle ABC$  and  $\triangle DEF$  are shown on the grid below.



Which of the following transformations will map  $\triangle ABC$  onto  $\triangle DEF$ ?

- A. Reflect  $\triangle ABC$  over the  $y$ -axis and shift up 6 spaces.
- B. Reflect  $\triangle ABC$  over the  $x$ -axis and shift up 6 spaces.
- C. Reflect  $\triangle ABC$  over the  $y$ -axis and shift down 6 spaces.
- D. Reflect  $\triangle ABC$  over the  $y$ -axis, reflect over the  $x$ -axis, and shift down 4 spaces.

47. In the graph below, figure  $M$  was rotated clockwise about the origin to generate figure  $T$ .

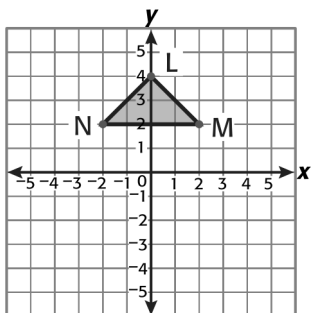


What was the angle of rotation of figure  $M$  about the origin?

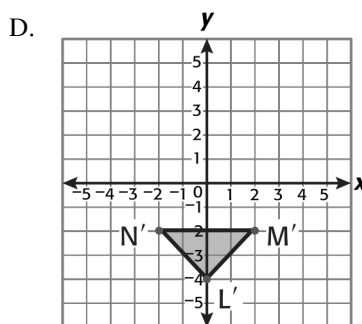
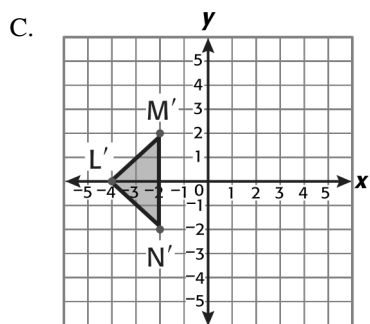
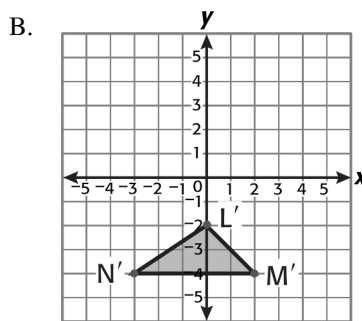
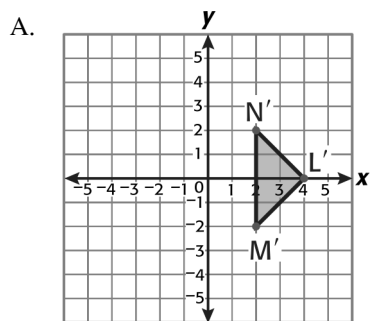
- A.  $90^\circ$
- B.  $180^\circ$
- C.  $270^\circ$
- D.  $360^\circ$



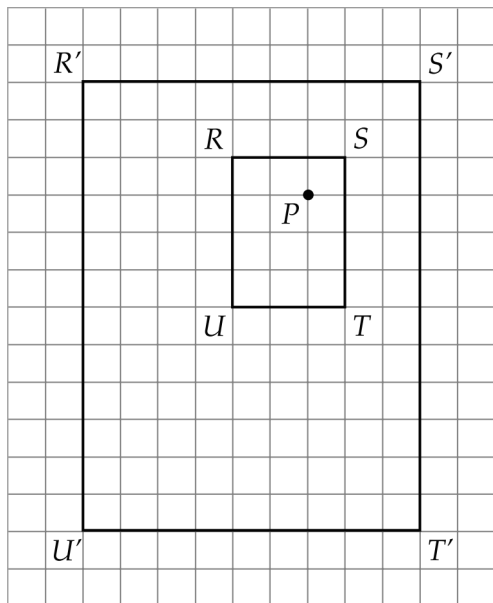
48. Look at  $\triangle LMN$  on the coordinate plane.



Which coordinate plane shows  $\triangle LMN$  after a  $90^\circ$  counterclockwise rotation about the origin?



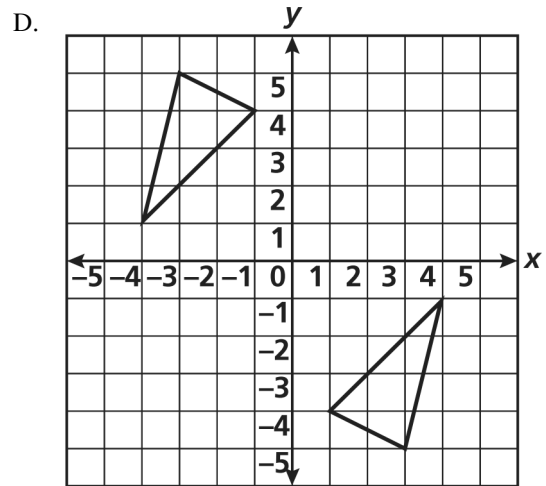
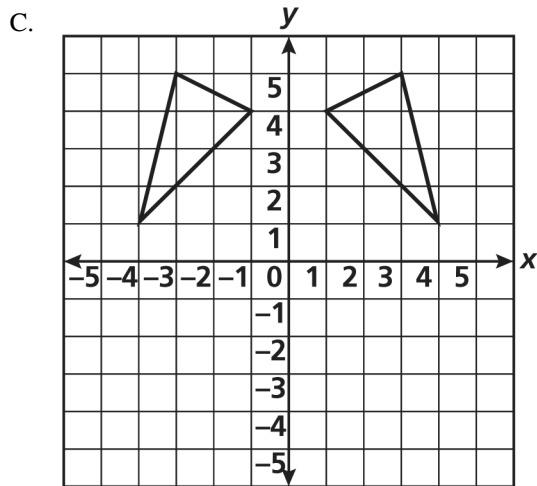
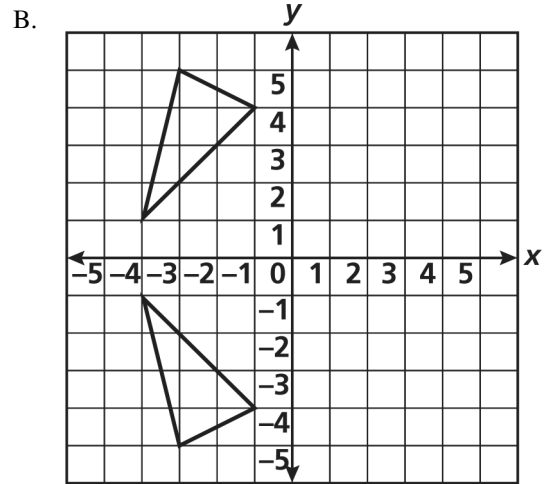
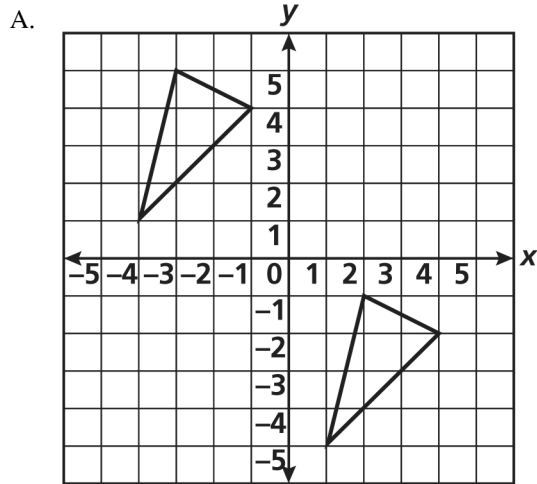
49. A dilation with center  $P$  maps the rectangle  $RSTU$  to the rectangle  $R'S'T'U'$  as shown below.



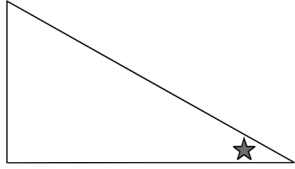
What is the scale factor of this dilation?

- A. 2      B. 3      C. 4      D. 9

50. Which of the following shows a triangle and the  $180^\circ$  rotation of the triangle about the origin?

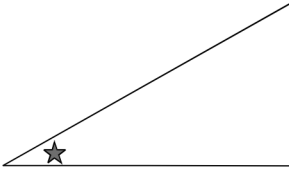


51. Ann rotates this triangle  $90^\circ$  clockwise.

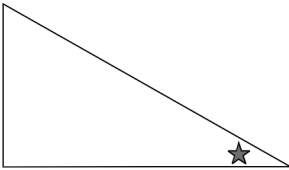


Which choice shows Ann's triangle after the  $90^\circ$  rotation?

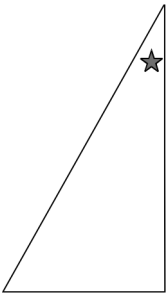
A.



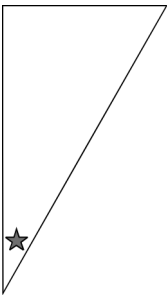
B.



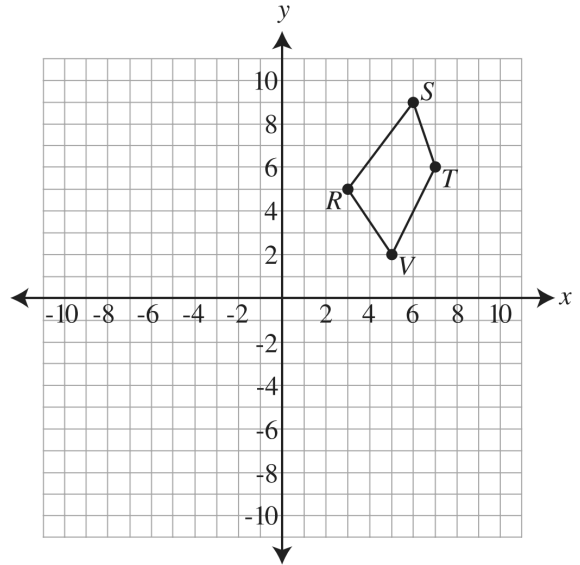
C.



D.



52. Quadrilateral  $STVR$  is graphed on the coordinate plane below.



Quadrilateral  $STVR$  will be rotated  $90^\circ$  clockwise about the origin  $(0, 0)$ . What will be the new coordinates of point  $R$ ?

A.  $(-5, 3)$

B.  $(-3, 5)$

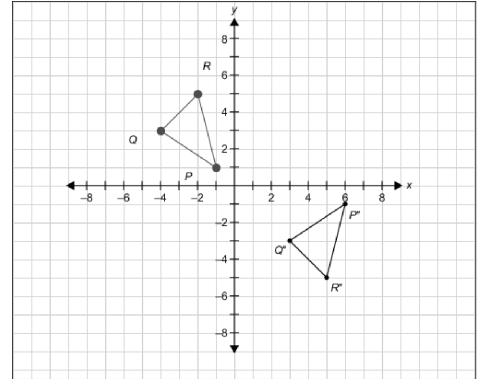
C.  $(3, -5)$

D.  $(5, -3)$

Reflections and Translations      02/10/2015

1. Answer: D
2. Answer: C
3. Answer: D
4. Answer: A
5. Answer: D
6. Answer: A
7. Answer: D
8. Answer: A
9. Answer: A
10. Answer: D
11. Answer: C
12. Answer: C
13. Answer: C
14. Answer: C
15. Answer: D
16. Answer: D
17. Answer: D
18. Answer: Triangle  $R'S'T'$  correctly with vertices at  $R'(-7, 2)$ ,  $S'(-5, 5)$ , and  $T'(-2, 1)$  and triangle  $R'S'T'$  correctly labeled

19. Answer: For this item, the response correctly: Shows triangle  $PQR$  with the vertices at the correct coordinates:  $P(-1, 1)$ ,  $Q(-4, 3)$  and  $R(-2, 5)$ . AND labels the vertices of triangle  $PQR$ . Ex:



20. Answer:  $(-2, -5)$
21. Answer: A
22. Answer:  $- C'(3, -4)$
23. Answer: C
24. Answer: B
25. Answer: D
26. Answer: A
27. Answer: B
28. Answer: B
29. Answer: C
30. Answer: B
31. Answer: D
32. Answer: B
33. Answer: D

34.  
Answer: D
35.  
Answer: A
36.  
Answer: a labeled pentagon with vertices at  $N(-2, 2)$ ,  $J(-5, 2)$ ,  $K(-6, 4)$ ,  $L(-4, 4)$ ,  $M(-2, 6)$
37.  
Answer: D
38.  
Answer: A
39.  
Answer: A
40.  
Answer: B
41.  
Answer: C
42.  
Answer: C
43.  
Answer: B, D, F
44.  
Answer: D
45.  
Answer: A
46.  
Answer: A
47.  
Answer: B
48.  
Answer: C
49.  
Answer:
50.  
Answer: D
51.  
Answer: D
52.  
Answer: D