

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

Key

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

1. If point  $(5, 2)$  is rotated counterclockwise  $90^\circ$  about the origin, its image will be point

- 1)  $(2, 5)$
- 2)  $(2, -5)$
- 3)  $(-2, 5)$
- 4)  $(-5, -2)$



2. What are the coordinates of  $A'$ , the image of  $A(-3, 4)$ , after a rotation of  $180^\circ$  about the origin?

- 1)  $(4, -3)$
- 2)  $(-4, -3)$
- 3)  $(3, 4)$
- 4)  $(3, -4)$

3. What are the coordinates of  $M'$ , the image of  $M(2, 4)$ , after a counterclockwise rotation of  $90^\circ$  about the origin?

- 1)  $(-2, 4)$
- 2)  $(-2, -4)$
- 3)  $(-4, 2)$
- 4)  $(-4, -2)$

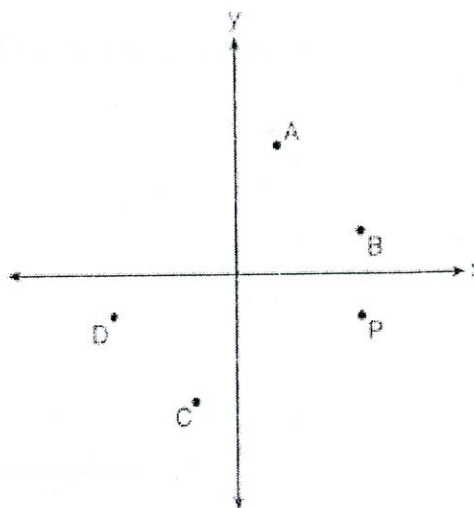
4. Point  $A$  is located at  $(4, -7)$ . The point is reflected in the  $x$ -axis. Its image is located at

- 1)  $(-4, 7)$
- 2)  $(-4, -7)$
- 3)  $(4, 7)$
- 4)  $(7, -4)$

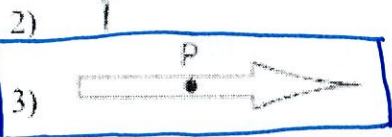
5. The accompanying diagram shows the starting position of the spinner on a board game.



6. Which point shown in the graph below is the image of point  $P$  after a counterclockwise rotation of  $90^\circ$  about the origin?



7. How does this spinner appear after a  $270^\circ$  counterclockwise rotation about point  $P$ ?



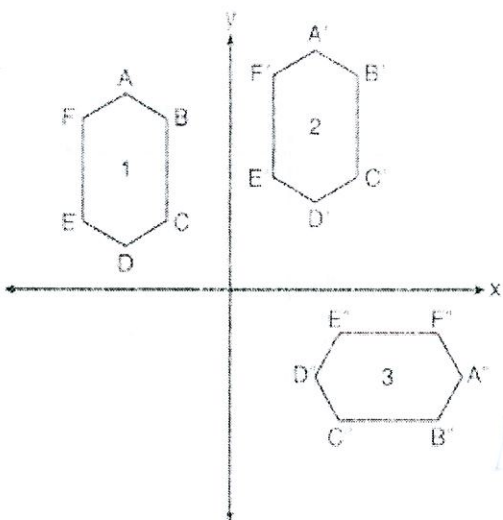
- 1)  $A$
- 2)  $B$
- 3)  $C$
- 4)  $D$

8. The image of point  $(3, 4)$  when reflected in the  $y$ -axis is
- 1)  $(-3, -4)$
  - 2)  $(-3, 4)$
  - 3)  $(3, -4)$
  - 4)  $(4, 3)$

10. Point  $(-2, 3)$  is reflected in the  $x$ -axis. In which quadrant does its image lie?
- 1) I
  - 2) II
  - 3) III
  - 4) IV

12. A translation moves  $P(3, 5)$  to  $P'(6, 1)$ . What are the coordinates of the image of point  $(-3, -5)$  under the same translation?
- 1)  $(0, -9)$
  - 2)  $(-5, -3)$
  - 3)  $(-6, -1)$
  - 4)  $(-6, -9)$

14. In the diagram below, congruent figures 1, 2, and 3 are drawn.

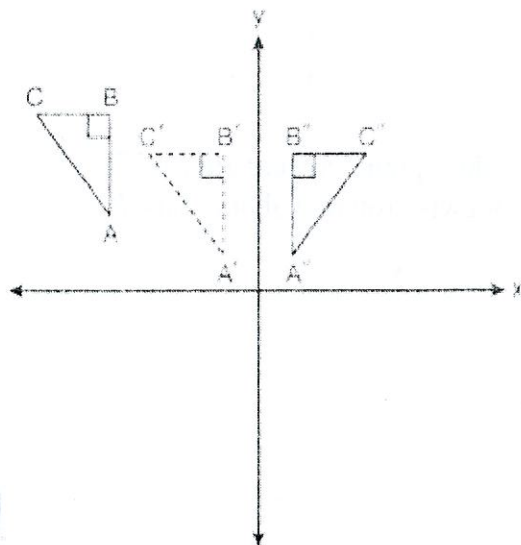


15. Which sequence of transformations maps figure 1 onto figure 2 and then figure 2 onto figure 3?
- 1) a reflection followed by a translation
  - 2) a rotation followed by a translation
  - 3) a translation followed by a reflection
  - 4) a translation followed by a rotation

9. What are the coordinates of point  $P$ , the image of point  $(3, -4)$  after a reflection in the line  $y = x$ ?
- 1)  $(3, 4)$
  - 2)  $(-3, 4)$
  - 3)  $(4, -3)$
  - 4)  $(-4, 3)$

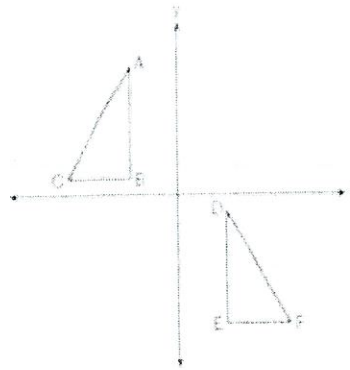
11. A function,  $f$ , is defined by the set  $\{(2, 3), (4, 7), (-1, 5)\}$ . If  $f$  is reflected in the line  $y = x$ , which point will be in the reflection?
- 1)  $(5, -1)$
  - 2)  $(-5, 1)$
  - 3)  $(1, -5)$
  - 4)  $(-1, 5)$

13. The image of point  $(-2, 3)$  under translation  $T$  is  $(3, -1)$ . What is the image of point  $(4, 2)$  under the same translation?
- 1)  $(-1, 6)$
  - 2)  $(0, 7)$
  - 3)  $(5, 4)$
  - 4)  $(9, -2)$

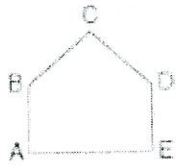


16. The composite transformation of  $\triangle ABC$  to  $\triangle A''B''C''$  is an example of a
- 1) reflection followed by a rotation
  - 2) reflection followed by a translation
  - 3) translation followed by a rotation
  - 4) translation followed by a reflection

18. In the diagram below,  $\triangle ABC \cong \triangle DEF$ .



17. Identify which sequence of transformations could map pentagon  $ABCDE$  onto pentagon  $A'B'C'D'E'$ , as shown below.

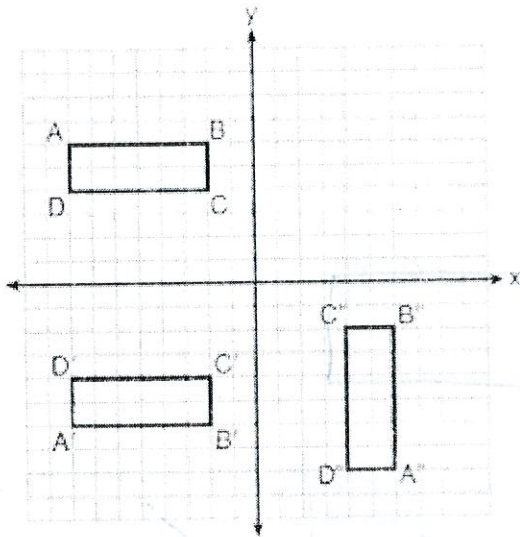


- 1) dilation followed by a rotation
- 2) translation followed by a rotation
- 3) line reflection followed by a translation
- 4) line reflection followed by a line reflection

20. Which sequence of transformations maps  $\triangle ABC$  onto  $\triangle DEF$ ?

- 1) a reflection over the  $x$ -axis followed by a translation
- 2) a reflection over the  $y$ -axis followed by a translation
- 3) a rotation of  $180^\circ$  about the origin followed by a translation
- 4) a counterclockwise rotation of  $90^\circ$  about the origin followed by a translation

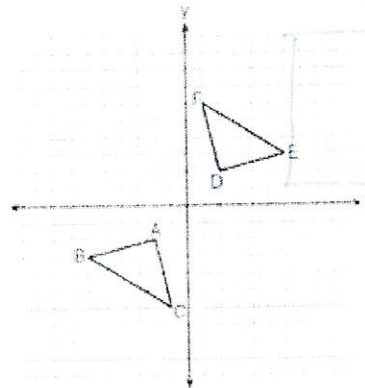
19. A sequence of transformations maps rectangle  $ABCD$  onto rectangle  $A'B'C'D'$ , as shown in the diagram below.



21. Which sequence of transformations maps  $ABCD$  onto  $A'B'C'D'$  and then maps  $A'B'C'D'$  onto  $A''B''C''D''$ ?

- 1) a reflection followed by a rotation
- 2) a reflection followed by a translation
- 3) a translation followed by a rotation
- 4) a translation followed by a reflection

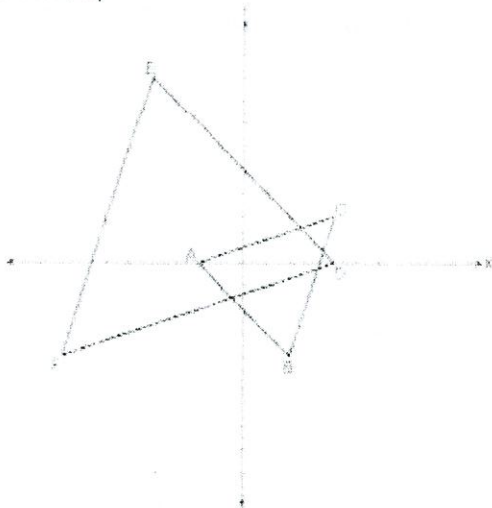
Triangle  $ABC$  and triangle  $DEF$  are graphed on the set of axes below.



22. Which sequence of transformations maps triangle  $ABC$  onto triangle  $DEF$ ?

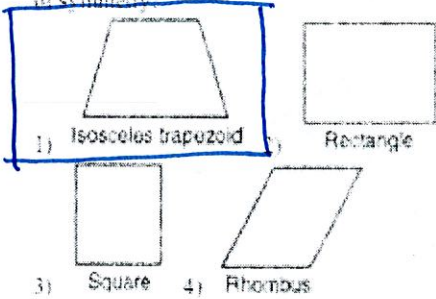
- 1) a reflection over the  $x$ -axis followed by a reflection over the  $y$ -axis
- 2) a  $180^\circ$  rotation about the origin followed by a reflection over the line  $y = x$
- 3) a  $90^\circ$  clockwise rotation about the origin followed by a reflection over the  $y$ -axis
- 4) a translation 8 units to the right and 1 unit up followed by a  $90^\circ$  counterclockwise rotation about the origin



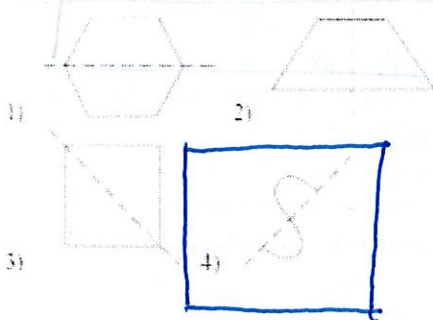


23. Which sequence of transformations will map  $\triangle ABC$  onto  $\triangle DEF$ ?
- 1) a dilation of  $\triangle ABC$  by a scale factor of 2 centered at point A
  - 2) a dilation of  $\triangle ABC$  by a scale factor of  $\frac{1}{2}$  centered at point A
  - 3) a dilation of  $\triangle ABC$  by a scale factor of 2 centered at the origin, followed by a rotation of  $180^\circ$  about the origin
  - 4) a dilation of  $\triangle ABC$  by a scale factor of  $\frac{1}{2}$  centered at the origin, followed by a rotation of  $180^\circ$  about the origin

24. Which geometric figure has one and only one line of symmetry?



25. Which diagram shows a dotted line that is *not* a line of symmetry?



26. Which letter has point symmetry?  
1) A 2) B 3) H 4) W

27. Which letter has both point and line symmetry?  
1) Z 2) T 3) C 4) H

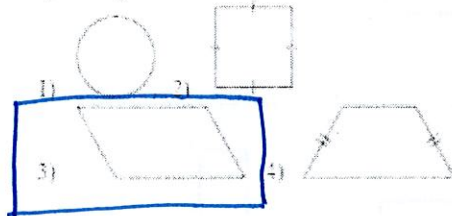
28. Which letter has both line and point symmetry?  
1) B 2) T 3) S 4) H

29. Which letter below has point symmetry, but does *not* have line symmetry?  
1) H 2) N 3) A 4) E

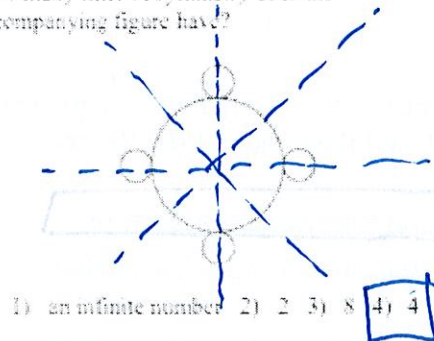
30. Which letter has point symmetry but not line symmetry?  
1) H 2) S 3) T 4) X

31. Which letter demonstrates line symmetry but not point symmetry?  
1) T 2) N 3) H 4) S

32. Which geometric shape does not have any lines of symmetry?



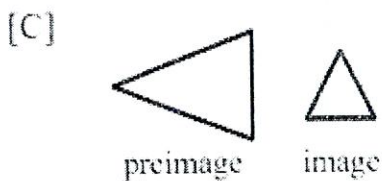
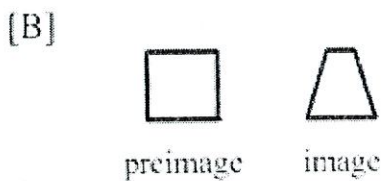
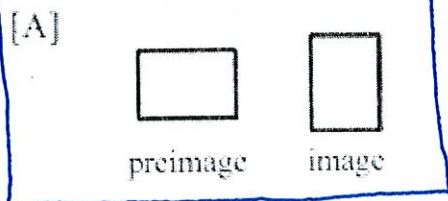
33. How many lines of symmetry does the accompanying figure have?



- 1) an infinite number 2) 2 3) 8 4) 4

34. Which shape does *not* have rotational symmetry?  
 1) trapezoid 2) regular pentagon 3) circle  
 4) square

36. Which of the following transformations represents an isometry?



38. A regular pentagon is shown in the diagram below.



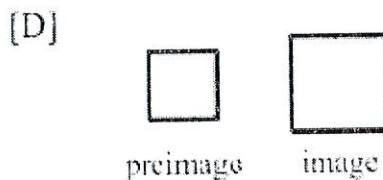
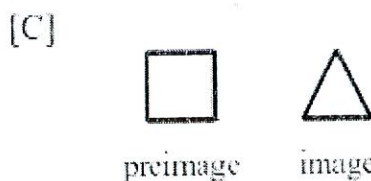
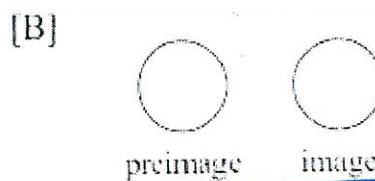
39. If the pentagon is rotated clockwise around its center, the minimum number of degrees it must be rotated to carry the pentagon onto itself is

- 1)  $54^\circ$   
 2)  $72^\circ$   
 3)  $108^\circ$   
 4)  $360^\circ$

35. After which transformation of  $\triangle ABC$  could the image  $\triangle A'B'C'$  *not* have the same area?

- 1) translation  
 2) rotation  
 3) point reflection  
 4) dilation

37. Which of the following transformations represents an isometry?



40. Which regular polygon has a minimum rotation of  $45^\circ$  to carry the polygon onto itself?

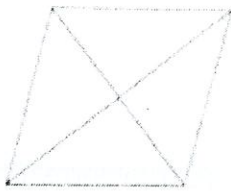
- 1) octagon  
 2) decagon  
 3) hexagon  
 4) pentagon

41. Which rotation about its center will carry a regular decagon onto itself?

- 1)  $54^\circ$   
 2)  $162^\circ$   
 3)  $198^\circ$   
 4)  $252^\circ$

42

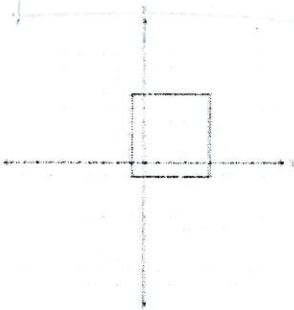
The figure below shows a rhombus with noncongruent diagonals.



Which transformation would *not* carry this rhombus onto itself?

- 1) a reflection over the shorter diagonal
- 2) a reflection over the longer diagonal
- 3) a clockwise rotation of  $90^\circ$  about the intersection of the diagonals
- 4) a counterclockwise rotation of  $180^\circ$  about the intersection of the diagonals

In the diagram below, a square is graphed in the coordinate plane.

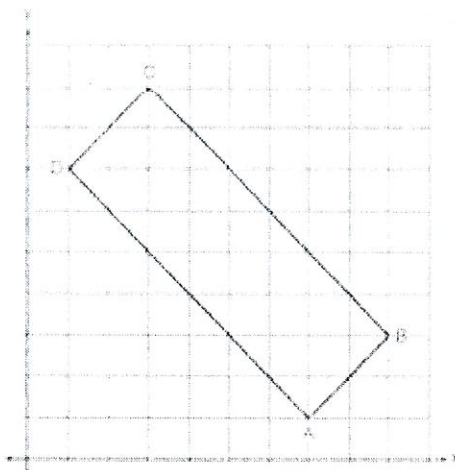


45.

A reflection over which line does *not* carry the square onto itself?

- 1)  $x = 5$
- 2)  $y = 2$
- 3)  $y = x$
- 4)  $x + y = 4$

In the diagram below, rectangle  $ABCD$  has vertices whose coordinates are  $A(7,1)$ ,  $B(9,3)$ ,  $C(3,9)$ , and  $D(1,7)$ .



47. Which transformation will *not* carry the rectangle onto itself?

- 1) a reflection over the line  $y = x$
- 2) a reflection over the line  $y = -x + 10$
- 3) a rotation of  $180^\circ$  about the point  $(6,6)$
- 4) a rotation of  $180^\circ$  about the point  $(5,5)$

43.

Which transformation would *not* carry a square onto itself?

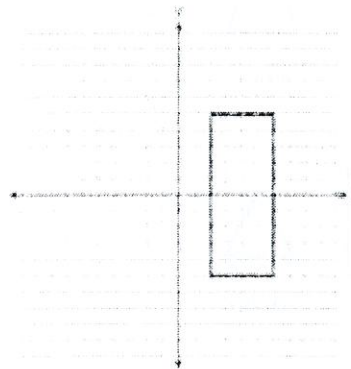
- 1) a reflection over one of its diagonals
- 2) a  $90^\circ$  rotation clockwise about its center
- 3) a  $180^\circ$  rotation about one of its vertices
- 4) a reflection over the perpendicular bisector of one side

44.

Which figure always has exactly four lines of reflection that map the figure onto itself?

- 1) square
- 2) rectangle
- 3) regular octagon
- 4) equilateral triangle

As shown in the graph below, the quadrilateral is a rectangle.



46.

Which transformation would *not* map the rectangle onto itself?

- 1) a reflection over the  $x$ -axis
- 2) a reflection over the line  $x = 4$
- 3) a rotation of  $180^\circ$  about the origin
- 4) a rotation of  $180^\circ$  about the point  $(4,0)$

48.

If  $\triangle A'B'C'$  is the image of  $\triangle ABC$ , under which transformation will the triangles *not* be congruent?

- 1) reflection over the  $x$ -axis
- 2) translation to the left 5 and down 4
- 3) dilation centered at the origin with scale factor 2
- 4) rotation of  $270^\circ$  counterclockwise about the origin