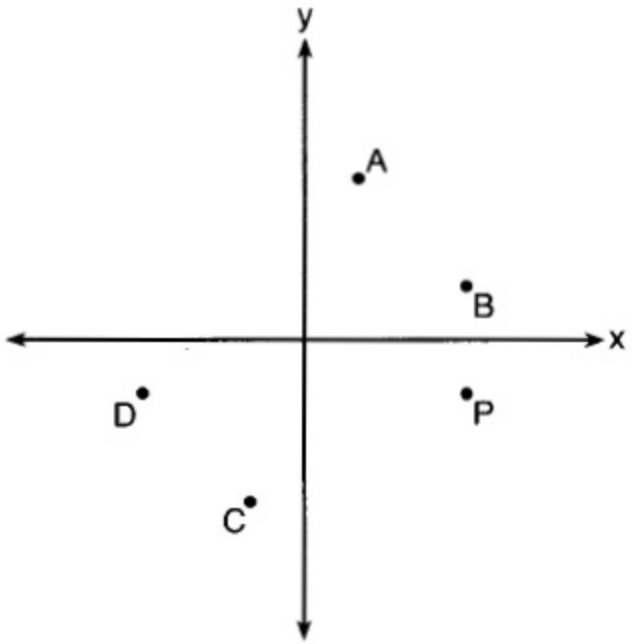
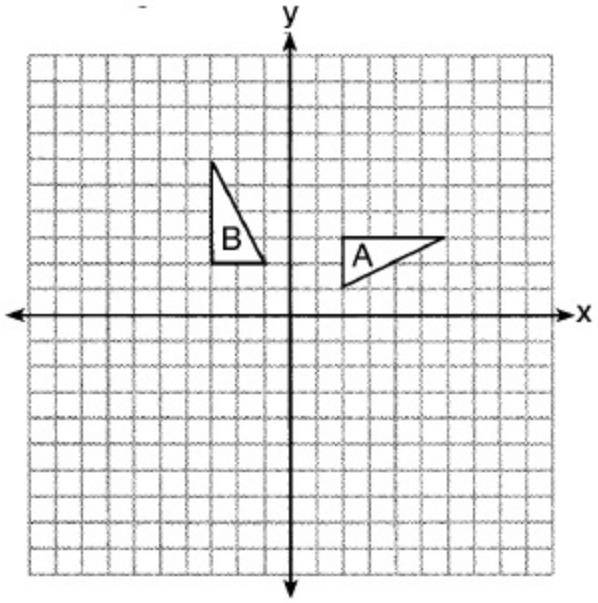
Station F: Transformations

1. Which point shown in the graph below is the image of point *P* after a counterclockwise rotation of 90° about the origin?



(1) *A* (2) *B* (3) *C* (4) *D*

2. In the diagram below, which single transformation was used to map triangle *A* onto triangle *B*?



(1) line reflection (2) rotation
(3) dilation (4) translation

3. Find the coordinates of P', the image of $P(3,-1)$ under the transformation $(x,y) \rightarrow (-y,-x)$.

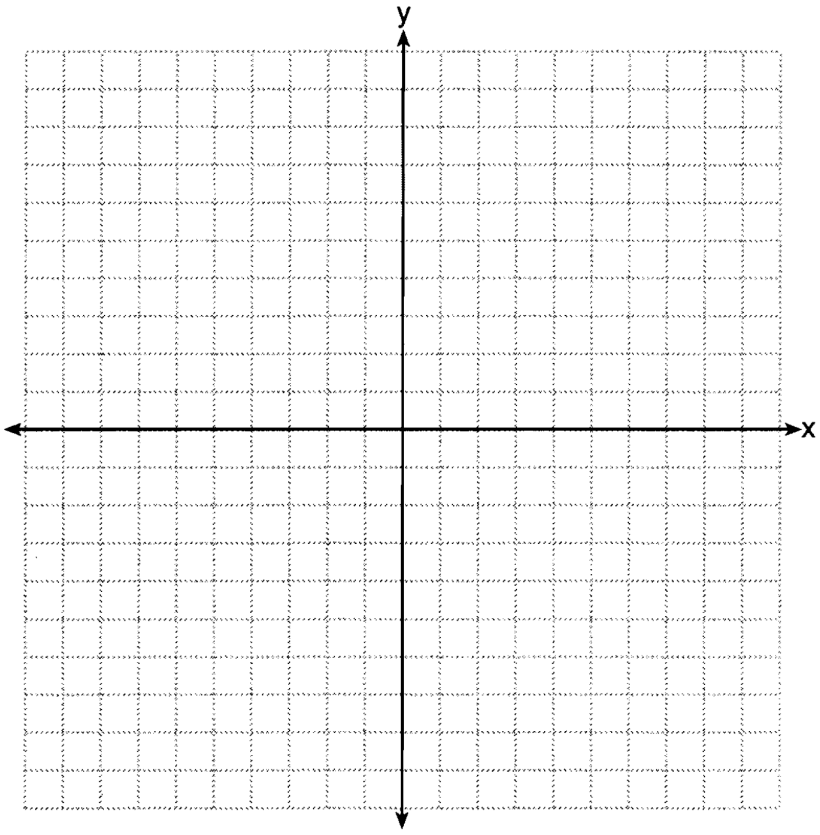
4. The point (3,-2) is rotated 90° about the origin and then dilated by a scale factor of 4. What are the coordinates of the resulting image?

   (1) (-12,8) (2) (12,-8) (3) (8,12) (4) (-8,-12)

5. What are the coordinates of A', the image of point $A(-3,4)$, after a rotation of 180º about the origin?

   (1) (4,–3) (2) (–4,–3) (3) (3,4) (4) (3,–4)

6. The coordinates of the vertices of ΔABC are $A(1,2)$, $B(-4,3)$, and $C(-3,-5)$. *State the coordinates of $\Delta A'B'C'$, the image of ΔABC after a rotation of 90º about the origin. [The use of the set of axes below is optional.]*



Station G: Transformations 2

7. What is the image of the point (-5,2) under the translation $T_{3,-4}$?

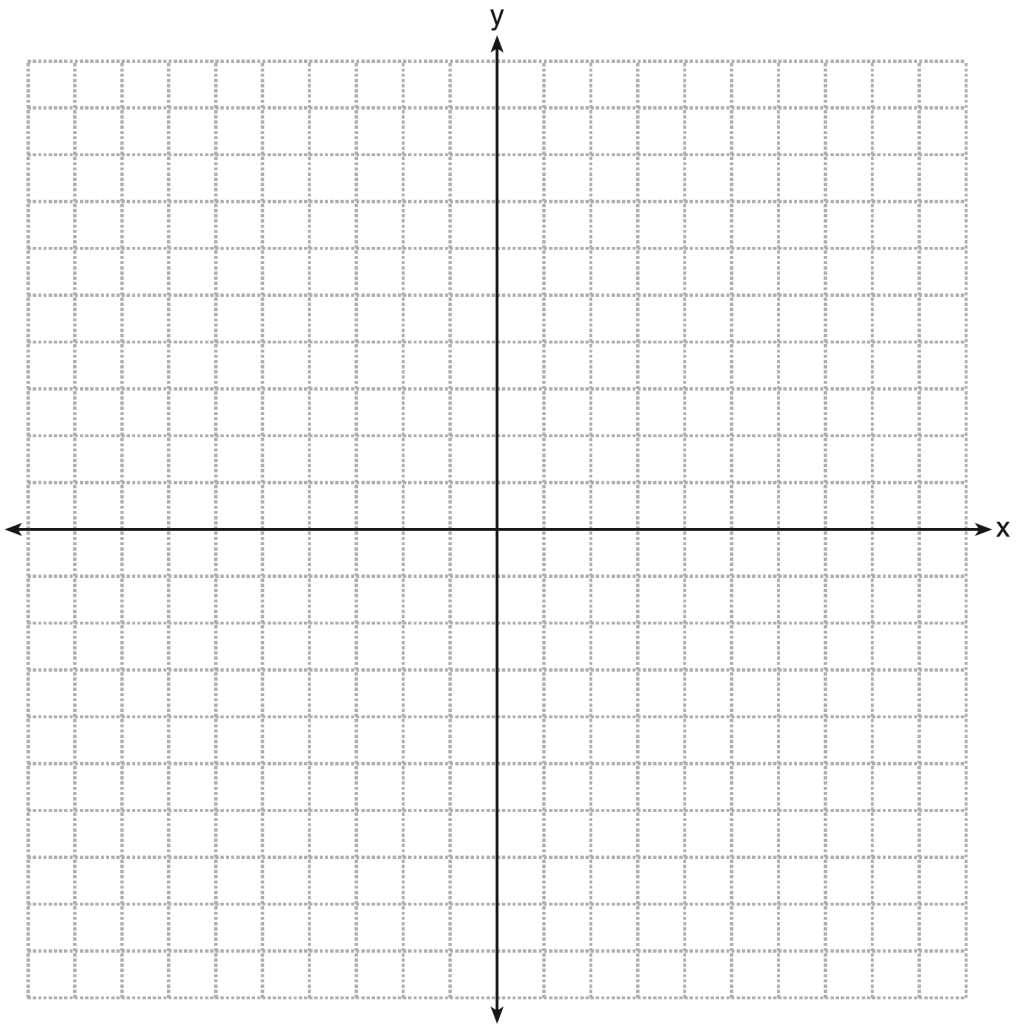
   (1) (-9,5) (2) (-8,6) (3) (-2,-2) (4) (-15,-8)

8. When the transformation $T_{2,-1}$ is performed on point *A*, its image is point $A'(-3,4)$. What are the coordinates of *A*?

   (1) $(5,-5)$ (2) $(-5,5)$ (3) $(-1,3)$ (4) $(-6,-4)$

9. Triangle *TAP* has coordinates *T*(−1,4), *A*(2,4), and *P*(2,O).

   On the set of axes below, graph and label $\Delta T'A'P'$, *the image of* ΔTAP *a*fter the translation$(x,y) \rightarrow (x-5, y-1)$.



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10. The image of point (3,–5) under the translation that shifts (*x*,*y*) to $(x-1, y-3)$ is

(1) (– 4,8) (2) (–3,15) (3) (2,8) (4) (2,– 8)

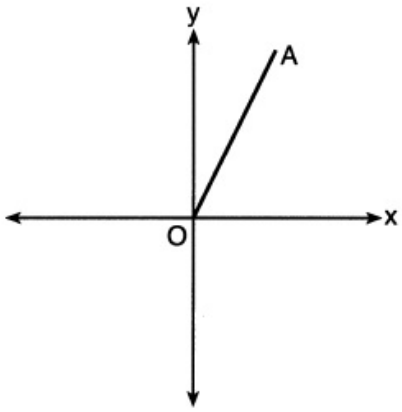
11. Triangle *ABC* has vertices *A*(1,3), *B*(0,1), and *C*(4,0). Under a translation, *A′*, the image point of *A*, is located at (4,4). Under this same translation, point *C′* is located at

(1) (7,1) (2) (5,3) (3) (3,2) (4) (1,–1)

12. The image of the origin under a certain translation is the point (2,–6). The image of point (–3,–2) under the same translation is the point

(1) (–6,12)
(2) (–5,4)
(3) $\left(-\frac{3}{2}, \frac{1}{3}\right)$
(4) (–1,–8)

13. Which transformation of $\overline{OA}$ would result in an image parallel to $\overline{OA}$?



(1) a translation of two units down
(2) a reflection over the *x*-axis
(3) a reflection over the y-axis
(4) a clockwise rotation of 90° about the origin

Station H: Transformations 3

14. Find the image of (1,5) when it is reflected over the line $y = x$.

15. Reflecting (5,1) in the y–axis yields an image of

(1) (5,−1) (2) (−5,−1) (3) (5,1) (4) (−5,1)

16. What is the image of (5,−2) under the transformation $r_{x=y}$?

(1) (−5,2) (2) (5,2) (3) (2,5) (4) (−2,5)

17. Find the image of $A(4,-3)$ under the transformation $r_{x=2}$.

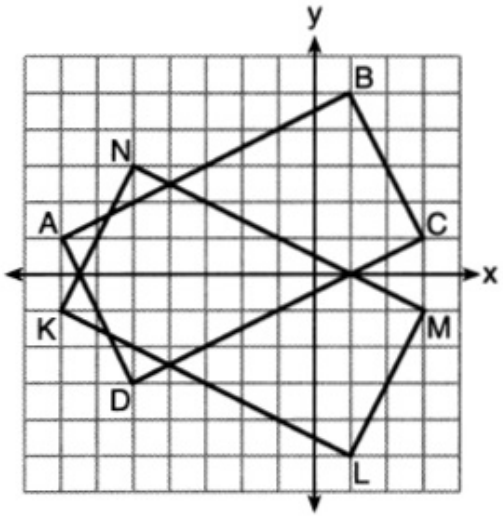
18. What is the image of point (–3,2) under a reflection in the origin?

(1) (–2,3) (2) (–2,–3) (3) (–3,–2) (4) (3,–2)

19. The coordinates of any point (x,y) after a reflection in the x–axis can *always* be represented by

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

20. On the set of axes below, rectangle $ABCD$ can be proven congruent to rectangle $KLMN$ using which transformation?



(1) rotation (2) translation
(3) reflection over the x-axis (4) reflection over the y-axis

21. If $A(2,7)$ is reflected in the line $y = 5$, what are the coordinates of A', the image of A?

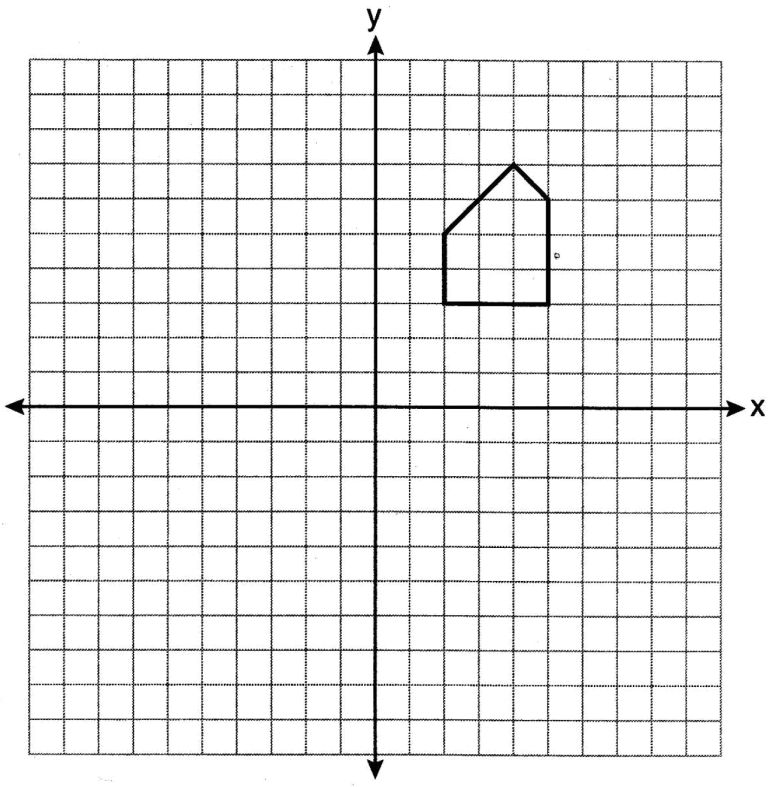
22. When a quadrilateral is reflected over the line $y = x$, which geometric relationship is *not* preserved?

(1) congruence (2) orientation
(3) parallelism (4) perpendicularity

23. The transformation $R_{90°}$ maps point (5,3) onto the point whose coordinates are

(1) (5,−3) (2) (3,−5) (3) (3,5) (4) (−3,5)

24. A pentagon is drawn on the set of axes below. If the pentagon is reflected over the y-axis, determine if this transformation is an isometry. Justify your answer. [The use of the set of axes below is optional.]



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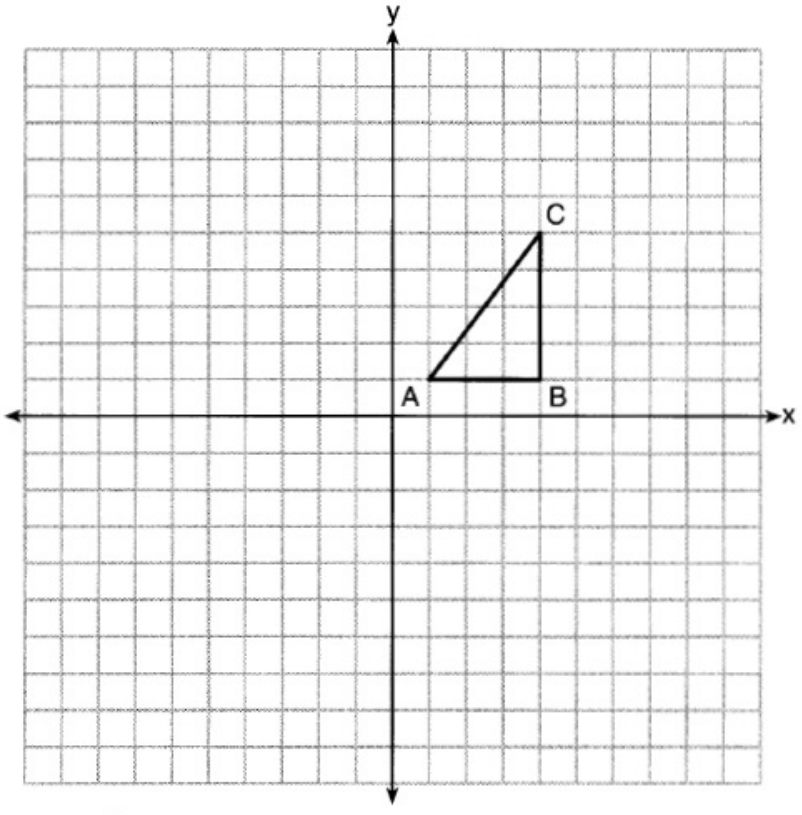
25. Which transformation produces a figure similar but *not* congruent to the original figure?

(1) $T_{1,3}$ (2) $D\frac{1}{2}$ (3) $R_{90°}$ (4) $r_{y=x}$

26. One function of a movie projector is to enlarge the image on the film. This procedure is an example of a

(1) line of symmetry (2) line reflection
(3) translation (4) dilation

27. In the diagram below, ΔABC has coordinates *A*(l,l), *B*(4,l), and *C*(4,5). Graph and label $\Delta A"B"C"$, the image of ΔABC after the translation five units to the right and two units up
followed by the reflection over the line $y = 0$.



28. Which transformation is *not* an isometry?

(1) rotation (2) line reflection
(3) dilation (4) translation

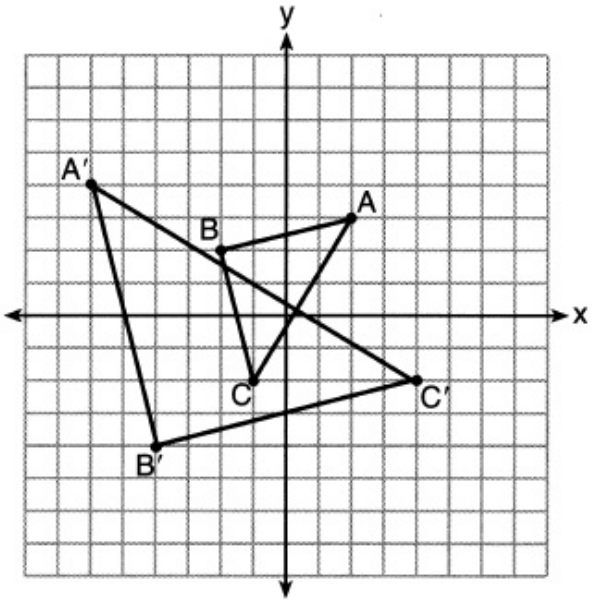
29. The vertices of ΔJKL have coordinates $J(5,1)$, $K(-2,-3)$, and $L(-4,1)$. Under which transformation is the image $\Delta J'K'L'$ not congruent to ΔJKL?

(1) a translation of two units to the right and two units down
(2) a counterclockwise rotation of 180 degrees around the origin
(3) a reflection over the x-axis
(4) a dilation with a scale factor of 2 and centered at the origin

30. Which transformation is *not* an isometry?

(1) $T_{(5,3)}$ (2) D_2 (3) $r_{x-\text{axis}}$ (4) $Rot_{(0,90^\circ)}$

31. Which sequence of transformations will map ΔABC onto $\Delta A'B'C'$?



(1) reflection and translation
(2) rotation and reflection
(3) translation and dilation
(4) dilation and rotation