90° ccw $(x,y) \rightarrow (-y,x)$
180° $(x,y) \rightarrow (-x,-y)$
270° ccw $(x,y) \rightarrow (y,-x)$

Coordinate Algebra

Name key

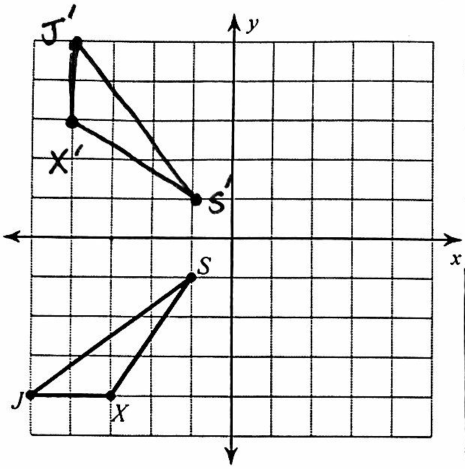
MILESTONE REVIEW Coach Book -- Unit 5

Date________________ Period____

Graph the image of the figure using the transformation given. Then write the vertices of the image.

270° ccw

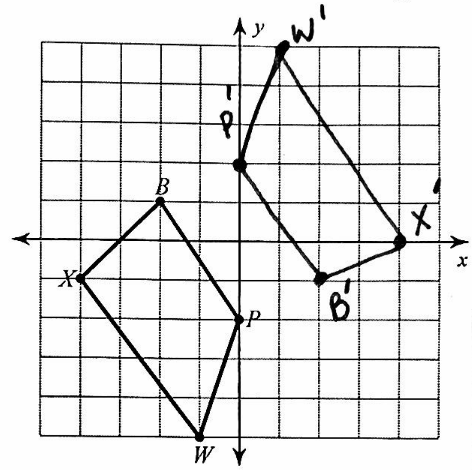
1) rotation 90° clockwise about the origin



S(-1, -1)
X(-3, -4)
J(-5, -4)

S′(-1, 1)
X′(-4, 3)
J′(-4, 5)

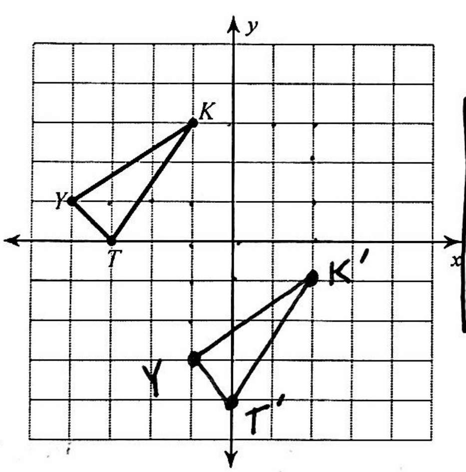
2) rotation 180° about the origin



X(-4, -1)
B(-2, 1)
P(0, -2)
W(-1, -5)

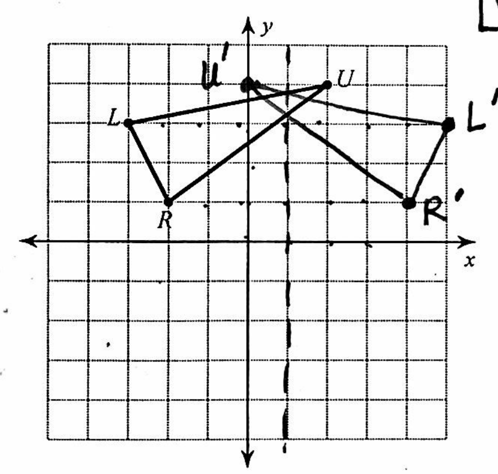
X′(4, 1)
B′(2, -1)
P′(0, 2)
W′(1, 5)

3) translation: 3 units right and 4 units down



K′(2, -1)
T′(0, -4)
Y′(-1, -3)

4) reflection across $x = 1$



U′(0, 4)
L′(5, 3)
R′(4, 1)

Write the vertices of the image after the given transformation.

5) reflection across the y-axis (change sign of x) $(-x, y)$
$A(1, -1)$, $B(-2, 3)$, $S(3, 3)$, $V(4, -2)$

A′(-1, -1) B′(2, 3) S′(-3, 3) V′(-4, -2)

6) rotation 90° counterclockwise about the origin
change sign of y and switch order $(-y, x)$
$G(-1, 4)$, $C(1, 1)$, $F(3, 0)$, $Y(3, -5)$

G′(4, -1) C′(-1, 1) F′(0, 3) Y′(5, 3)

Find the coordinates of the vertices of each figure after the given transformation.

7) reflection across the x-axis
change sign of y $(x, -y)$
$S(-5, 4)$, $B(-2, 0)$, $T(0, 3)$

A) $B'(~~0, 0~~)$, $T'(-2, -3)$, $S'(3, -4)$
B) $B'(-2, 0)$, $T'(0, 3)$, $S'(-5, 4)$
C) $B'(0, 2)$, $T'(3, 0)$, $S'(4, 5)$
D) $B'(0, -2)$, $T'(-3, 0)$, $S'(-4, -5)$

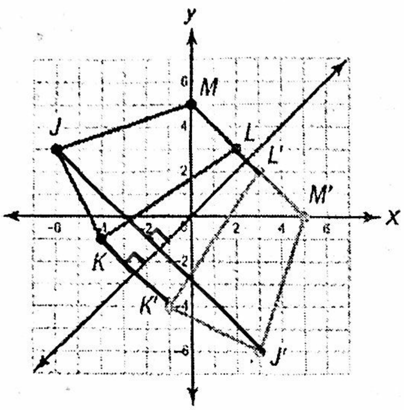
8) reflection across $y = x$
switch order (y, x)
$Q(1, 0)$, $Y(0, 4)$, $N(1, 4)$, $E(3, 1)$

A) $Y'(-4, 0)$, $N'(-4, -1)$, $E'(-1, -3)$, $Q'(~~0, -1~~)$
B) $Y'(0, 0)$, $N'(1, 0)$, $E'(3, 3)$, $Q'(~~1, 4~~)$
C) $Y'(4, 0)$, $N'(4, 1)$, $E'(1, 3)$, $Q'(0, 1)$
D) $Y'(0, -4)$, $N'(1, -4)$, $E'(3, -1)$, $Q'(~~1, 0~~)$

$P(-4,3) \xrightarrow[\langle +10,-2\rangle]{} P'(6,1)$

9. Point P at (-4, 3) is translated to form image, point P', at (6,1). Write a function to represent the translation. If point R (-5, 6) and point S (1, 2) are also translated using the rule, what will be the coordinates of their images? R' (5, 4) S' (11, 0)

$(x,y) \rightarrow (x+10, y-2)$ or $\langle 10,-2\rangle$

10. 

Quadrilateral JKLM and its reflected image are shown. Which statement is true of these two quadrilaterals?

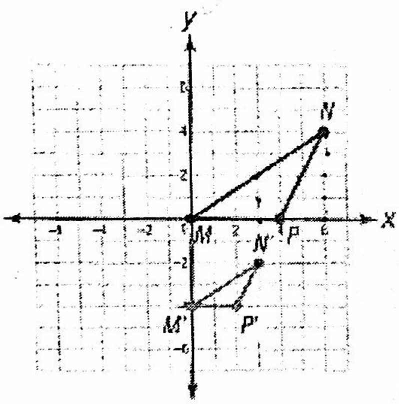
a) The image shows the result of a reflection across the ~~x-axis~~.

b) The path that point L takes across the line of reflection is perpendicular to the line of reflection. ✓

c) Each point (x, y) on quadrilateral JKLM maps to point ~~(-y, x)~~ (y, x) on its image.

d) Corresponding sides of quadrilateral JKLM and its image are ~~parallel~~.

11. Which sequence of transformations can be used to map ΔMNP onto $\Delta M'N'P'$?



$N(6,4) \times \frac{1}{2} = (3,2)$ $\langle 0,-4\rangle$

$N'(3,-2)$ $(3,-2)$

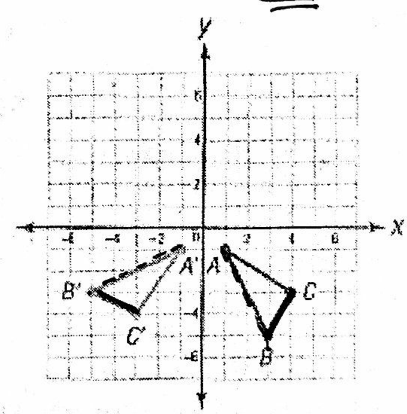
A. dilation by a factor of ½ followed by a translation 4 units down ✓

B. dilation by a factor of ½ followed by a 270° ~~rotation~~

C. vertical shrink by a factor of ½ followed by a translation 4 units down — would only change the y's

D. vertical shrink by a factor of ½ followed by a ~~270° rotation~~

12. ΔABC is transformed to $\Delta A'B'C'$. Which statement is **NOT** true?



B(3,-5)

B'(-5,-3)

A. This transformation shows the image of ΔABC after a 270° rotation about the origin ✓

B. This transformation preserved the distances and angle measure of the original figure. ✓

C. Sides $\overline{AB}$ and $\overline{A'B'}$ lie on lines that are ~~parallel~~ to one another. X

D. Sides $\overline{BC}$ and $\overline{B'C'}$ lie on lines that are perpendicular to one another. ✓