NAME Key DATE _____ SCORE _____

Practice 56
Supplementary Practice

Lessons 14-1 through 14-3

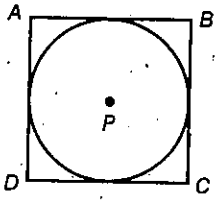
In Exercises 1–3, $f: x \to 3x + 8$.

1. Find the image of -5. -7
2. Find the preimage of 2. -2
3. Is f a one-to-one function? yes

In the figure, $\odot P$ is inscribed in square $ABCD$.

4. Describe a way of mapping each point of $\odot P$ to a point of $ABCD$ so that the mapping is one-to-one. forevery pt. X on $\odot P$, map X to X' on ABCD

5. Is the mapping an isometry? no

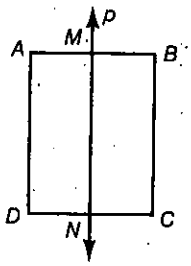


Exs. 4, 5

For the mapping $T: (x, y) \to (x + 3, y - 1)$, find the following.

6. The image of (2, 1) (5, 0)
7. The image of (4, −2) (7, −3)
8. The preimage of (0, 0) (−3, 1)
9. The preimage of (5, −3) (2, −2)
10. Does T appear to be an isometry? yes

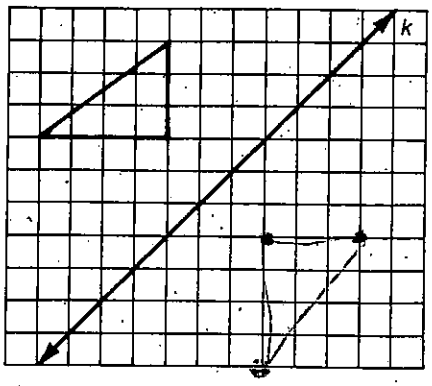
In the figure, line p is the perpendicular bisector of both $\overline{AB}$ and $\overline{DC}$. Complete.



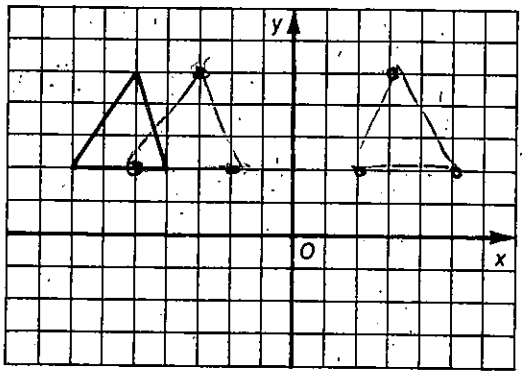
11. $R_p: \overline{AB} \to$ $\overline{BA}$
12. $R_p: \overline{AM} \to$ $\overline{BM}$
13. $R_p:$ $\overline{BC}$ $\to \overline{AD}$
14. $R_p:$ $\overline{MN}$ $\to \overline{MN}$

Draw the image of each figure by the transformation specified.

15. Reflection in line k



16. Glide 2 units to the right, followed by reflection in the y-axis



Practice

1) Consider this example of a translation that maps A(-1,4) into A′(3,2). Find the translation rule.

$T:(x,y) \rightarrow (x+4, y-2)$

2) Consider this example of a translation that maps A(-2,5) into A′(-2,2). Find the translation rule.

$T:(x,y) \rightarrow (x, y-3)$

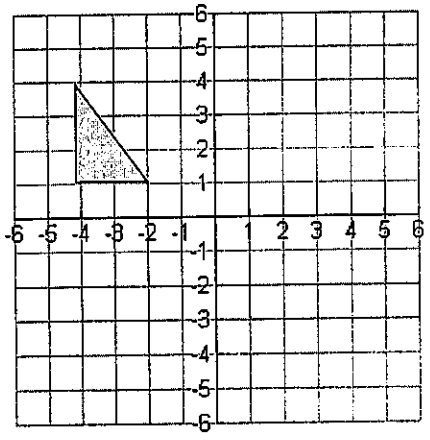
3) Given A(2, 1), B(3, 3), and C(-1, 3).
Find the image of Triangle ABC under the translation
(x, y) → (x – 2, y – 5)

$A'(0,-4)$
$B'(1,-2)$
$C'(-3,-2)$

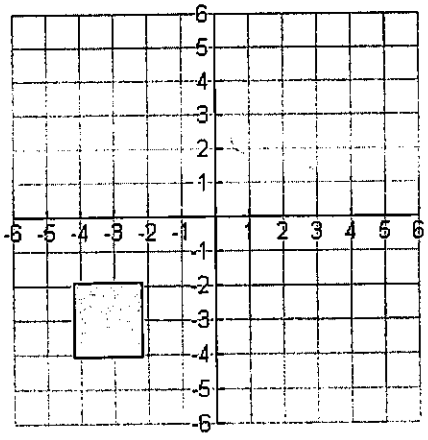
4) Given A(1, 2), B(3, 3), and C(3, -1).
Find the image of Triangle ABC under the translation
(x, y) → (x – 2, y – 5)

$A'(-1,-3)$
$B'(1,-2)$
$C'(1,-6)$

5) Find the image of the figures under the translation
(x, y) → (x + 3, y – 1)



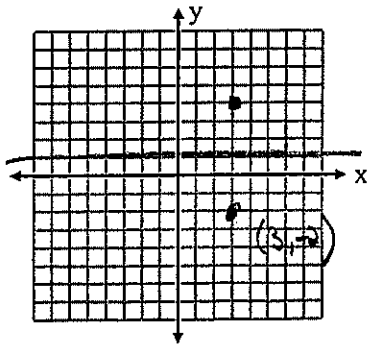
6) Find the image of the figures under the translation
(x, y) → (x + 2, y + 5)



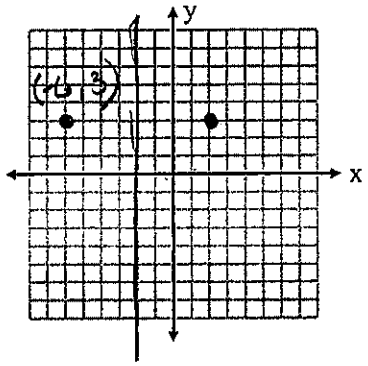
Reflections over a horizontal or vertical line

To reflect over a horizontal or vertical line, first determine the perpendicular distance of your given point to the reflecting line. Then place your image point the same distance away on the other side of the line.

For example, reflect the point (3,4) over the line y=1.

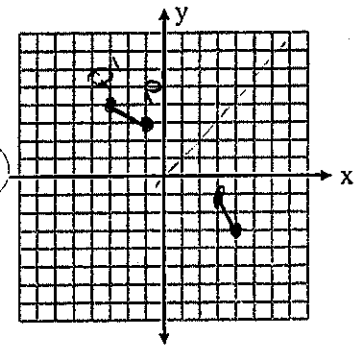


Now try (2,3) over x=-2.

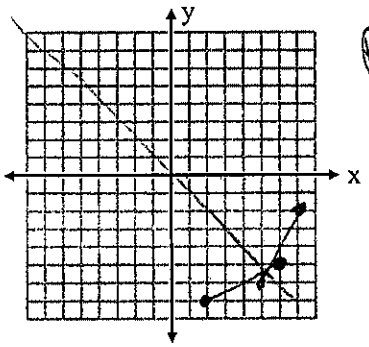


Reflections over y = x

Reflect $\overline{PQ}$ over the line y = x.
P(3, -1) and Q (4, -3)



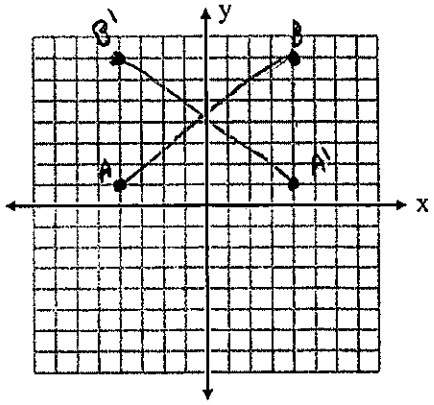
Reflect $\overline{PQ}$ over y = -x.
p (2, -7) and Q (6, -5)



Examples

Graph $\overline{AB}$ using the points A(-4, 1) and B(4,7) and graph the image after a reflection in the y-axis.

A'(4, 1) B'(-4, 7)



Find the slope of $\overline{AB}$ $\frac{6}{8} = \frac{3}{4}$.

Find the slope of $\overline{A'B'}$ $\frac{6}{-8} = \frac{-3}{4}$.

How are these slopes related? opp.

Write the equation of the line that contains AB *and A' and B'*. What do you notice about the y-intercepts? Would this also happen if the reflection had been in the x-axis

$y - 1 = \frac{3}{4}(x - (-4))$

$y - 1 = \frac{3}{4}x + 3$

AB: $y = \frac{3}{4}x + 4$

$y - 1 = -\frac{3}{4}(x - 4)$

$y - 1 = -\frac{3}{4}x + 3$

A'B' $y = -\frac{3}{4}x + 4$

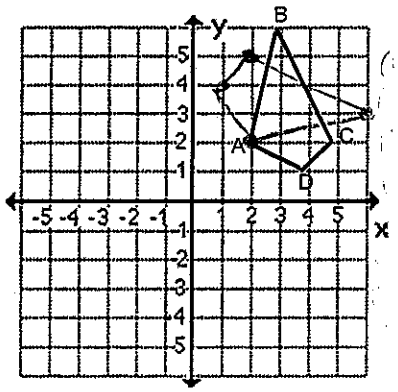
Reflections on the Coordinate Plane:

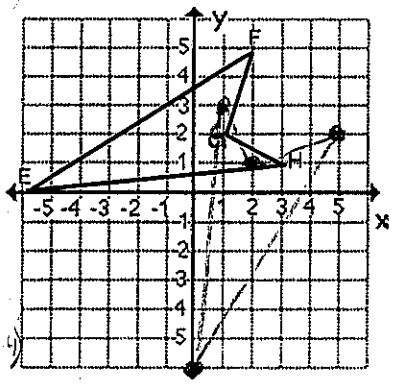
Points reflected over the lines y = x and y = - x are related to their preimages in a special way. Using coordinates makes these relationships especially clear.

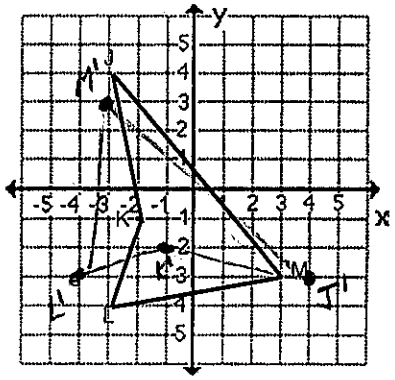
On the following diagrams:

a. Label the coordinates of the vertices for each figure
b. Sketch the reflections of each figure over the indicated lines y = x and y = - x.
c. Label the coordinates of the vertices of the image figures.

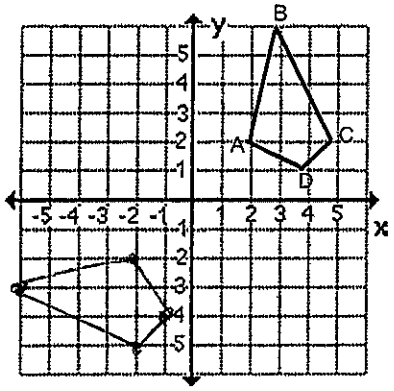
y = x

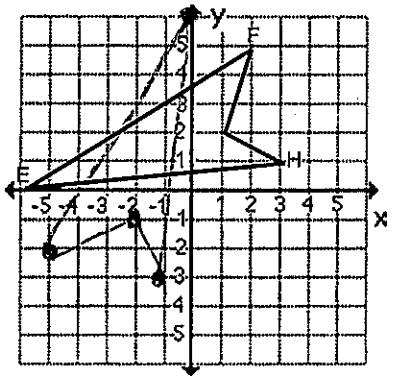


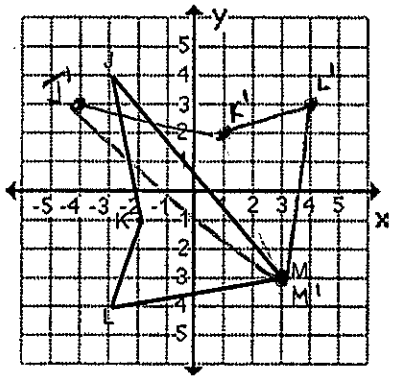




y = - x







Original Points	Over y = x	Over y = - x
A (2,2)	(2,2)	(-2,-2)
B (3,6)	(6,3)	(-6,-3)
C (5,2)	(2,5)	(-2,-5)
D (4,1)	(1,4)	(-1,-4)

Original Points	Over y = x	Over y = - x
E (-6,0)	(0,-6)	(0,6)
F (2,5)	(5,2)	(-5,-2)
G (1,2)	(2,1)	(-2,-1)
H (3,1)	(1,3)	(-1,-3)

Original Points	Over y = x	Over y = - x
J (-3,4)	(4,-3)	(-4,3)
K (-2,-1)	(-1,-2)	(1,2)
L (-3,-4)	(-4,-3)	(4,3)
M (3,-3)	(-3,3)	(3,-3)