

8.4 Symmetry on the Co-ordinate Plane Pt. 1

Translations, Reflections and Rotations

A. Translations:

Translation – Slide / Shift of a figure over a specific distance & direction.
(left / right or up / down)

Ex: 1) Translate $\triangle ABC$, $A(2,1)$, $B(4,5)$, $C(9,1)$, (Left 3, Down 4)

Mapping diagram

current location $x-3$ $y-4$

$A(2,1) \rightarrow (2-3; 1-4) \rightarrow (-1, -3)$

$\triangle A'B'C'$

$B(4,5) \rightarrow (4-3; 5-4) \rightarrow (1, 1)$

$C(9,1) \rightarrow (9-3; 1-4) \rightarrow (6, -3)$

* Left: Subtract from x Down: Subtract from y
Right: Add to x Up: Add to y

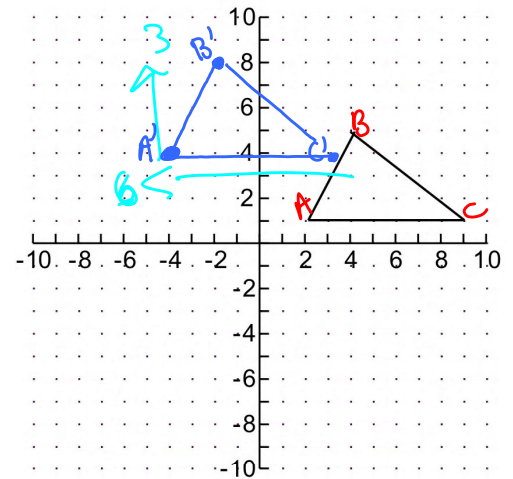
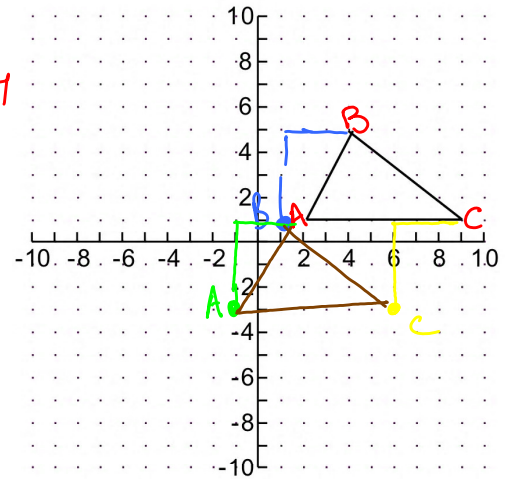
Ex: 2) Translate $\triangle ABC$ (Left 6, Up 3)

$A(2,1) \rightarrow (2-6; 1+3) \rightarrow (-4, 4)$

$B(4,5) \rightarrow (4-6; 5+3) \rightarrow (-2, 8)$

$C(9,1) \rightarrow (9-6; 1+3) \rightarrow (3, 4)$

Left 6 Up 3



B. Reflections:

Reflections – Image flipped over a line to create a mirror image

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Shapes can be reflected over:

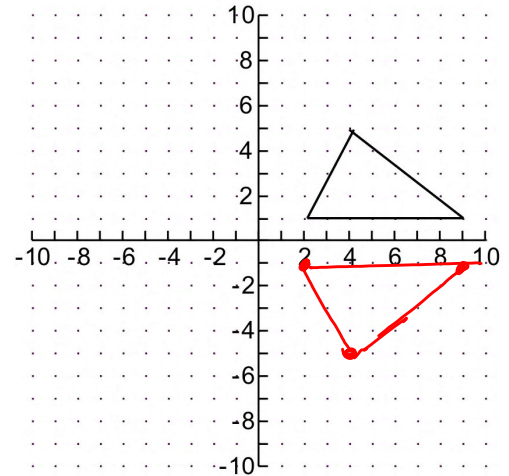
- x -axis
- y -axis
- diagonal ($y=x$)
- any other line.

Ex: 1) Reflect $\triangle ABC$, $A(2,1)$, $B(4,5)$, $C(9,1)$ over the x -axis.

When you reflect over the x -axis:

$$(x, y) \rightarrow (x, -y)$$

$$\begin{aligned} A(2,1) &\rightarrow A'(2, -1) \\ B(4,5) &\rightarrow B'(4, -5) \\ C(9,1) &\rightarrow C'(9, -1) \end{aligned}$$

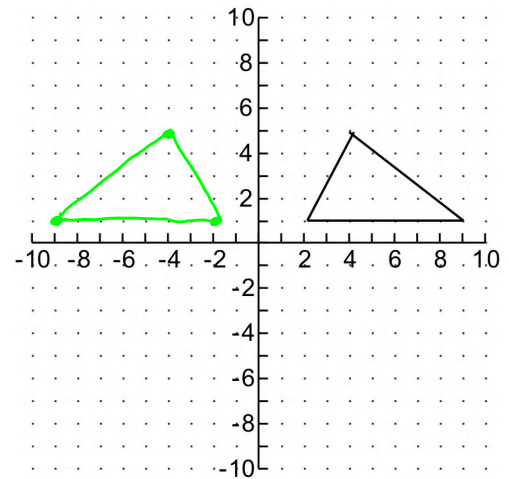


Ex: 2) Now reflect $\triangle ABC$ over the y -axis:

When you reflect over the y -axis:

$$(x, y) \rightarrow (-x, y)$$

$$\begin{aligned} A(2,1) &\rightarrow A''(-2, 1) \\ B(4,5) &\rightarrow B''(-4, 5) \\ C(9,1) &\rightarrow C''(-9, 1) \end{aligned}$$

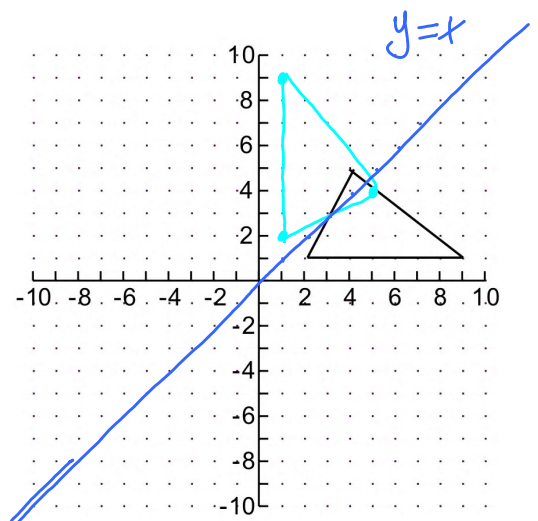


Ex: 3) Now, reflect $\triangle ABC$ over the line $y = x$

When you reflect over $y = x$:

$$(x, y) \rightarrow (y, x)$$

$$\begin{aligned} A(2,1) &\rightarrow A'''(1, 2) \\ B(4,5) &\rightarrow B'''(5, 4) \\ C(9,1) &\rightarrow C'''(1, 9) \end{aligned}$$



Homework: pg. 392 #1acd, 2ac, 3, 4, 5, 6

Worksheet 8.4 Practice #1