

**Unit 2 Transformations and Congruence**  
**Lesson 4 Composition of Transformations**

Name \_\_\_\_\_

*Directions: Use graph paper to perform the following transformations. Fill in the chart with the coordinates of the image. Attach your graph paper to the worksheet!*

1. Pre-image: A(0,0), B(8,1), C(5,5)

Rotate the figure 180° $(-x, -y)$	(0,0) (-8,-1) (-5,-5)
Reflect the figure over the x-axis $(-x, y)$	(0,0) (-8,1) (-5,5)
Translate the figure according to $(x,y) \rightarrow (x+6,y-1)$ $(-x+6, y-1)$	(6,-1) (-2,0) (1,4)
Write an algebraic rule to take $(x,y) \rightarrow (x',y')$	$(-x+6, y-1)$

2. Pre-image: D(-12,6), E(-4,6), F(-6,9), G(-10,9)

Translate the figure according to $(x,y) \rightarrow (x+1,y-6)$	(-11,0) (-3,0) (-5,3) (-9,3)
Reflect the figure over the x-axis $(x+1, -y+6)$	(-11,0) (-3,0) (-5,-3) (-9,-3)
Reflect the figure over the y-axis $(-x-1, -y+6)$	(11,0) (3,0) (5,-3) (9,-3)
Write an algebraic rule to take $(x,y) \rightarrow (x',y')$	$(-x-1, -y+6)$

3. Pre-image: H(2,2), I(-2,2), J(-2,-2), K(2,-2)

Rotate the figure 180° $(-x, -y)$	(-2,-2) (2,-2) (2,2) (-2,2)
Translate the figure according to $(x,y) \rightarrow (x+2,y+2)$ $(-x+2, -y+2)$	(0,0) (4,0) (4,4) (0,4)
Reflect the figure over the line $y = x$ $(-y+2, -x+2)$	(0,0) (0,4) (4,4) (4,0)
Write an algebraic rule to take $(x,y) \rightarrow (x',y')$	$(-y+2, -x+2)$

4. Pre-image: L(7,2), M(0,9), N(-6,-5), P(1,-12)

Reflect the figure over the y-axis $(-x, y)$	$(-7, 2) (0, 9) (6, -5) (-1, -12)$
Reflect the figure over the x-axis $(-x, -y)$	$(-7, -2) (0, -9) (6, 5) (-1, 12)$
Rotate the figure $90^\circ$ clockwise about the origin $(-y, x)$	$(-2, 7) (-9, 0) (5, -6) (0, 9)$
Write an algebraic rule to take $(x, y) \rightarrow (x', y')$	$(-y, x)$

5. Pre-image: Q(0,0), R(-13,0), S(0,12)

Rotate the figure $270^\circ$ clockwise about the origin $(-y, x)$	$(0, 0) (0, -13) (-12, 0)$
Translate the figure according to $(x, y) \rightarrow (x+5, y+5)$ $(-y+5, x+5)$	$(5, 5) (5, -8) (-7, 5)$
Write an algebraic rule to take $(x, y) \rightarrow (x', y')$	$(-y+5, x+5)$

6. Pre-image: T(6,-3), U(8,-5), V(7,-7), W(5,-7), X(4,-5)

Translate the figure according to $(x, y) \rightarrow (x-4, y+3)$	$(2, 0) (4, -2) (3, -4) (1, -4) (0, -2)$
Reflect the figure over the line $y = x$ $(y+3, x-4)$	$(0, 2) (-2, 4) (-4, 3) (-4, 1) (-2, 0)$
Rotate the figure $180^\circ$ $(-y-3, -x+4)$	$(0, -2) (2, -4) (4, -3) (4, -1) (2, 0)$
Write an algebraic rule to take $(x, y) \rightarrow (x', y')$	$(-y-3, -x+4)$