November 18, 2015

Honors Geometry

Notes Section 4.9

Perform Congruence Transformations

VOCABULARY

Transformation: an operation that moves or changes a geometric figure: translation, rotation or reflection.

Image: resulting figure after a transformation

Translation: moves every point of a figure the same distance in the same direction.

Reflection: uses a line of reflection to create a mirror image of the original figure.

Rotation: turns a figure about a fixed point.

Center of Rotation: fixed point

Congruence Transformation: changes the position of the figure without changing its size or shape.

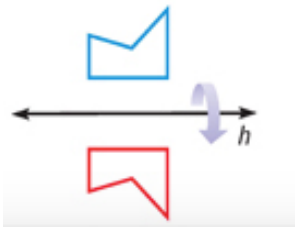
Coordinate Notation: $(x,y) \rightarrow (x + \#, y + \#)$

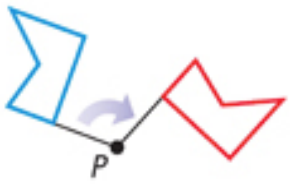
Reflection Across the X-axis: $(x,y) \rightarrow (x, -y)$

Reflection Across the Y-axis: $(x,y) \rightarrow (-x, y)$

Angle of Rotation: formed by 2 rays drawn from the center of rotation: clockwise or counter-clockwise

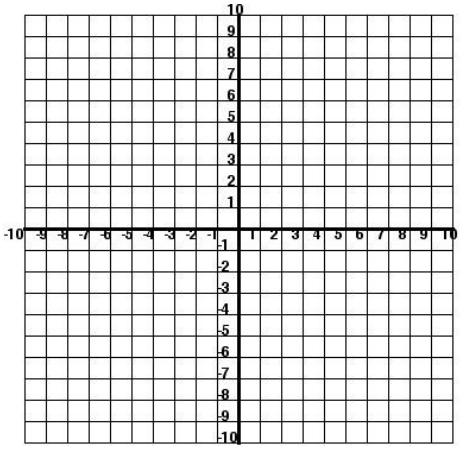
EXAMPLE 1 Name the type of transformation.

a) 

b) 

c) 

EXAMPLE 2 Figure ABCD has the vertices A(-4,3), B(-2,4), C(-1,1) & D(-3,1). Sketch ABCD and its image after the translation (x,y) → (x+5,y-2).



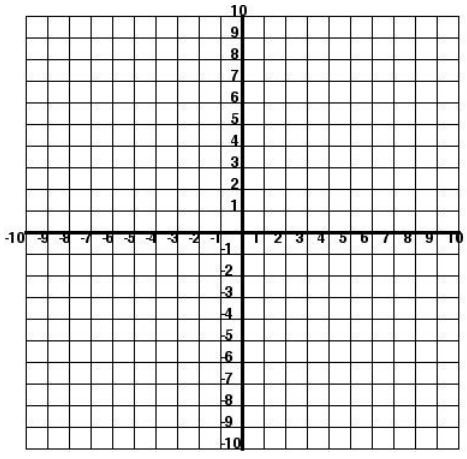
A(-4,3) → _____

B(-2,4) → _____

C(-1,1) → _____

D(-3,1) → _____

EXAMPLE 3 You are drawing a pattern. Use a reflection across the x-axis to complete the other half of the pattern.



(x,y) → _____

(-1,0) → _____

(-1,2) → _____

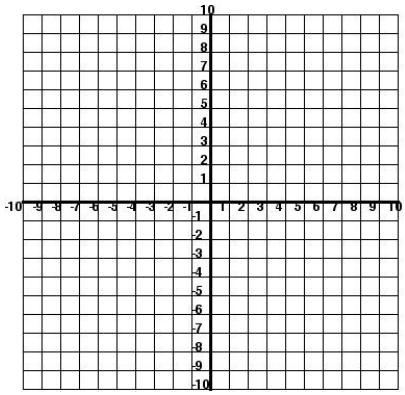
(1,2) → _____

(1,4) → _____

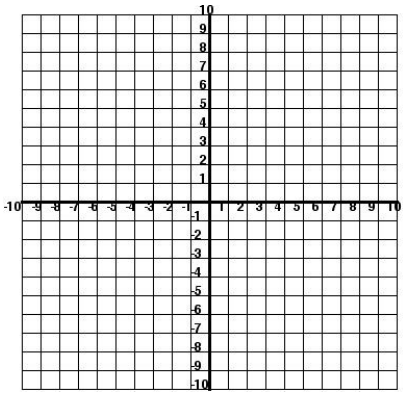
(5,0) → _____

EXAMPLE 4 Graph AB and CD. Tell whether CD is a rotation of AB about the origin. If so, give the angle and direction of rotation.

a) A(-3,1), B(-1,3), C(1,3) & D(3,1)

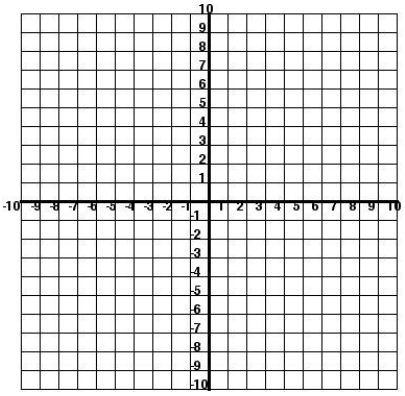


b) A(0,1), B(1,3), C(-1,1) & D(-3,2)



_____ _____

EXAMPLE 5 The vertices of ΔABC are A(4,4), B(6,6) and C(7,4). The notation (x,y) → (x+1,y-3) describe the translation of ΔABC to ΔDEF. Show that ΔABC≅ΔDEF to verify that the translation is a congruence transformation.



STEP 1 Show a set of ≅ sides _____

STEP 2 Show a 2nd set of ≅ sides (Distance Formula)

_____

_____

STEP 3 Find the SLOPES of the sides that form ∠A & ∠B.

_____ _____

_____ _____