Geometry 1-BE Monday 5-9-11

1. Name and describe the 4 geometry transformations. Which ones are "congruent transformations"?

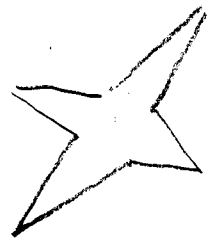
2. $f(x) = \frac{3}{2}x - 5$

   A. $f^{-1}(x) = ?$

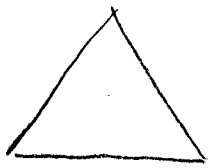
   B. $f(4) = ?$

   C. $f^{-1}(4) = ?$

Geometry I ⇒ HW Review Pg 467 #5-7, 12-17, 24, 25

(5) 

2 lines of symmetry
Yes, point symmetry

(6) 

3 lines of symmetry
No point symmetry

(7) see book ⇒ 6 lines of symmetry
Yes, point symmetry

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(12) 

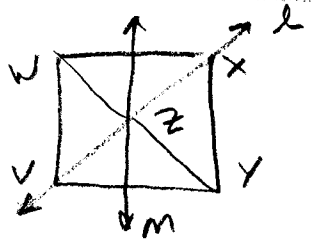
1 line of symmetry
no point symmetry

(13) 

4 line of symmetry
Yes, point symmetry

(14) See Book ⇒ Tiger Face ⇒ 1 line of symmetry
Not point symmetric

Name reflected part in line ℓ



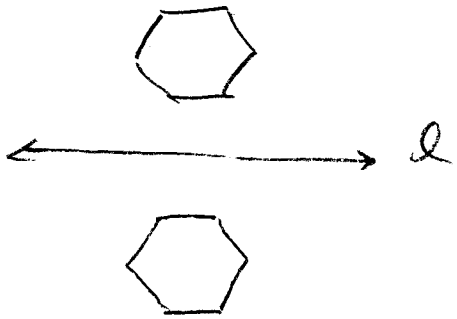
(15) $\overline{WX}$ and $\overline{YX}$

(16) $\overline{WZ}$ and $\overline{YZ}$

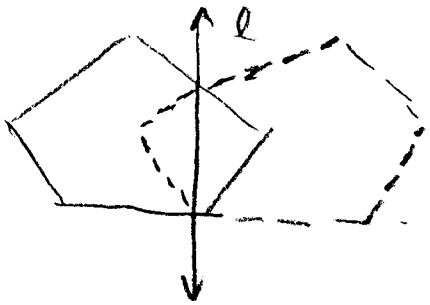
(17) $\angle XZY$ and $\angle XZW$

Reflect in line ℓ

(24)



(25)



Reflections in the Coordinate Plane

A notation that can be used to "map" a transformation of a point in the x-y Coordinate Plane is:

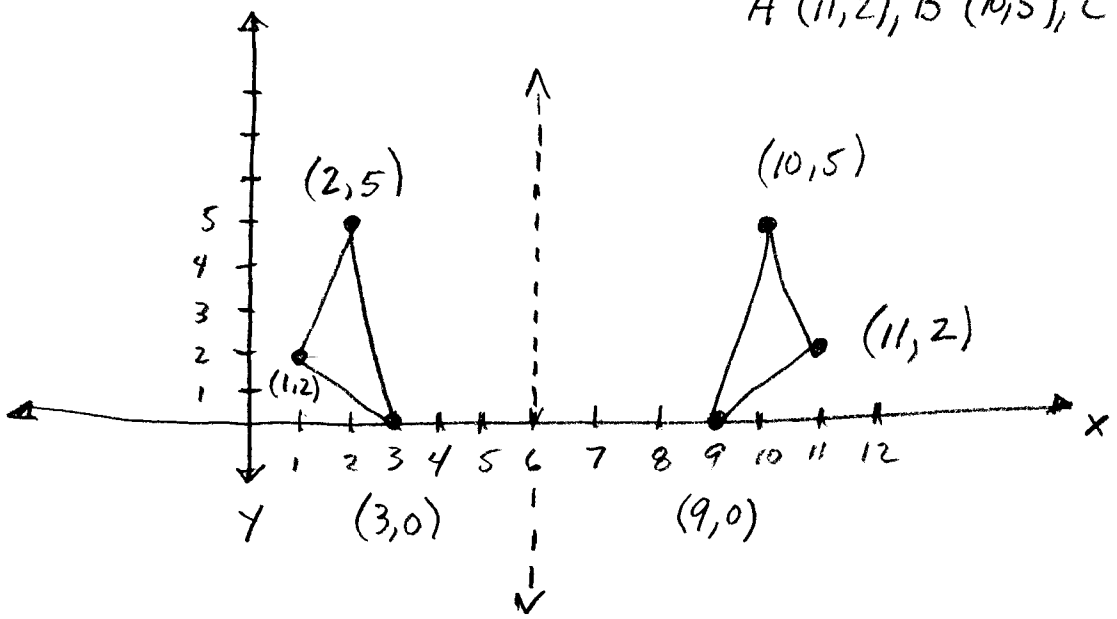
$$P(2,-4) \longrightarrow P'(2,4)$$

preimage image

Read: Point P is mapped to Point P'

(Ex) Reflect △ with vertices at $A(1,2), B(2,5), C(3,0)$ across (or in) the line $x = 6$

$A'(11,2), B'(10,5), C'(9,0)$



Matrices are a powerful way to express a transformation on the coordinate plane.

$$A_x = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} \quad A_y = \begin{bmatrix} 2 \\ 5 \\ 0 \end{bmatrix}$$ Position of $\triangle A$

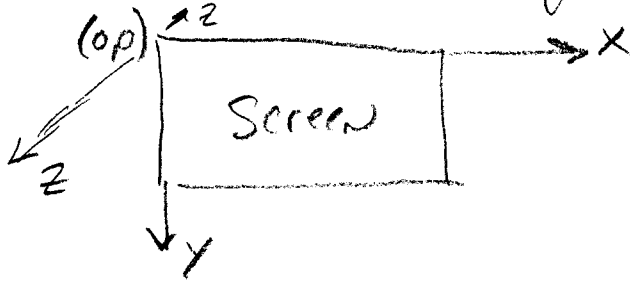
Let $T_x = \begin{bmatrix} 12 \\ 12 \\ 12 \end{bmatrix}$ Your transformation in the x direction

$$A'_x = T_x - A_x \qquad A'_y = A_y$$

$$A'_x = \begin{bmatrix} 12-1 \\ 12-2 \\ 12-3 \end{bmatrix} = \begin{bmatrix} 11 \\ 10 \\ 9 \end{bmatrix} \quad A'_y = \begin{bmatrix} 2 \\ 5 \\ 0 \end{bmatrix}$$

New position of $A'\triangle$

Perfect for computers, like moving a wizard or a spaceship!



Three very common line reflections in the X-Y Coordinate Plane are:

1. Reflections in the X-axis (across X axis)
2. Reflections in the Y-axis (across Y axis)
3. Reflections across the line $Y = X$

Recall: inverse functions are symmetric across this line

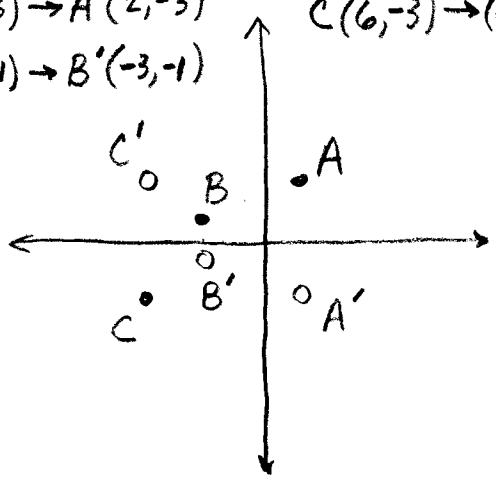
A common point reflection in the X-y Coordinate Plane is:

1. Reflection in the origin (Point symmetry about (0,0))

Examples 2 → 5 on Pages 464-465

* TABLE on Page 465

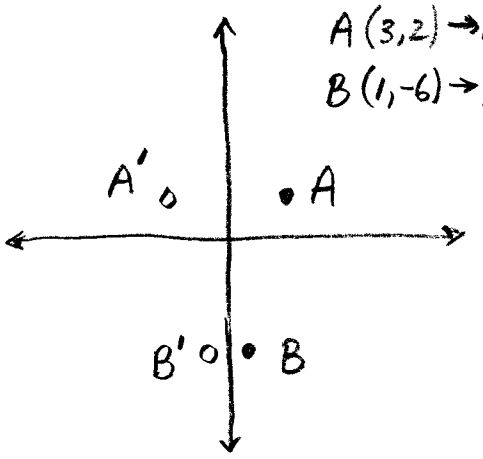
$A(2,3) \to A'(2,-3)$
$B(-3,1) \to B'(-3,-1)$
$C(6,-3) \to (6,3)$



REFLECT ACROSS X-AXIS

MULTIPLY Y BY -1

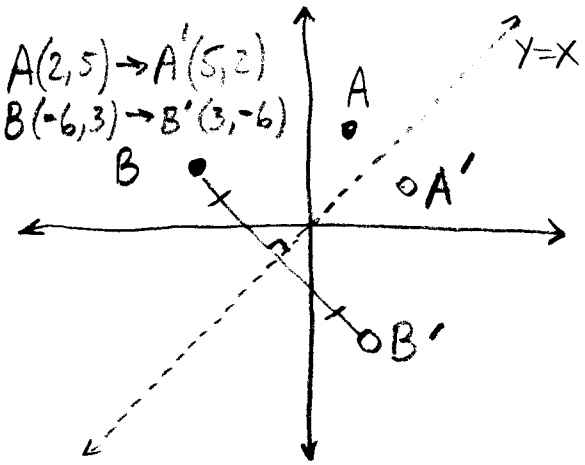
$A(3,2) \to A'(-3,2)$
$B(1,-6) \to B'(-1,6)$



REFLECT ACROSS Y-AXIS

MULTIPLY X BY -1

$A(2,5) \to A'(5,2)$
$B(-6,3) \to B'(3,-6)$

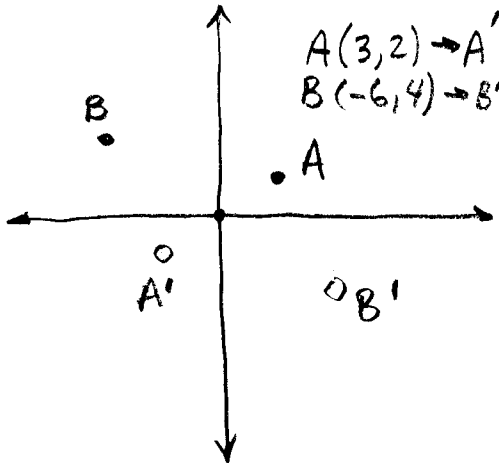


REFLECT ACROSS LINE $Y = X$

SWAP X AND Y

INVERSE FUNCTIONS!

$A(3,2) \to A'(-3,-2)$
$B(-6,4) \to B'(6,-4)$



POINT REFLECTION ACROSS (or in) ORIGIN

MULTIPLY X AND Y BY -1

HOMEWORK: Pg 468 #27, 29, 30, 31, 32