Warm Up

1. What is the slope of the segment with endpoints at (-7, 4) and (4, -7)?

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $\frac{-7-4}{4-7} = \frac{-11}{11}$ -1

2. Add: $\begin{bmatrix} 5 & -3 \\ 2 & 0 \end{bmatrix} + \begin{bmatrix} -7 & 9 \\ -1 & 6 \end{bmatrix}$ $\begin{bmatrix} -2 & 6 \\ 1 & 6 \end{bmatrix}$

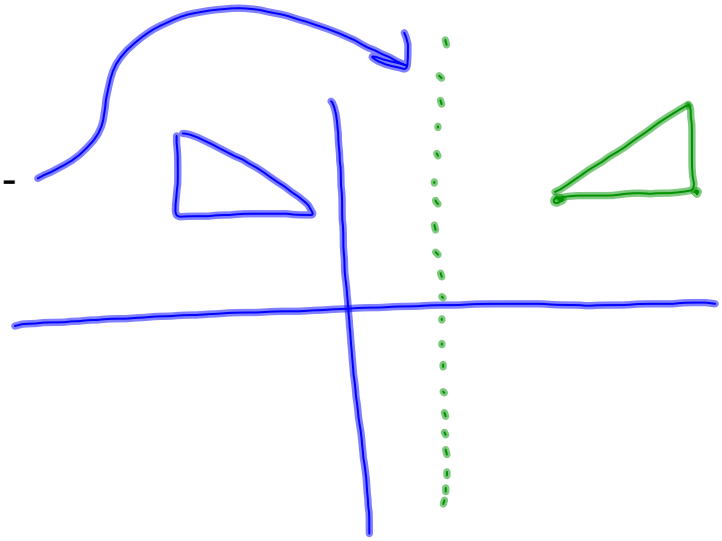
$2\times2 \quad 2\times3$

3. Multiply: $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} 6 & -2 & 1 \\ 3 & 4 & 7 \end{bmatrix}$ $\begin{bmatrix} -6 & 2 & -1 \\ 3 & 4 & 7 \end{bmatrix}$

9-3 Reflections

Reflection - Flip

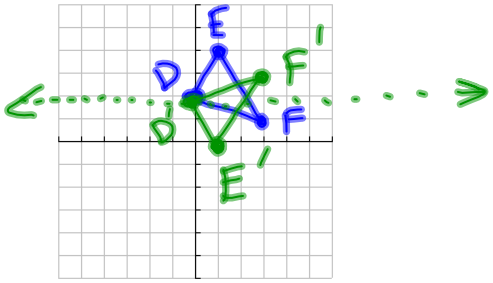
Line of reflection -



Ex 1 The vertices of triangle DEF are $D(0, 2)$, $E(1, 4)$, and $F(3, 1)$. Graph the reflection described.

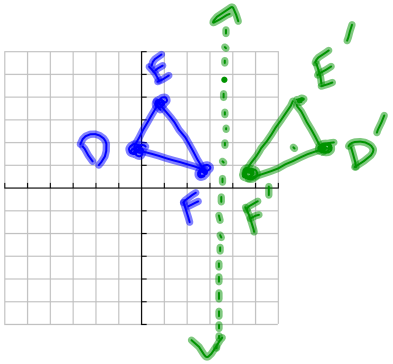
in the line $y = 2$

horizontal $y = 2$



in the line $x = 4$

$x = 4$

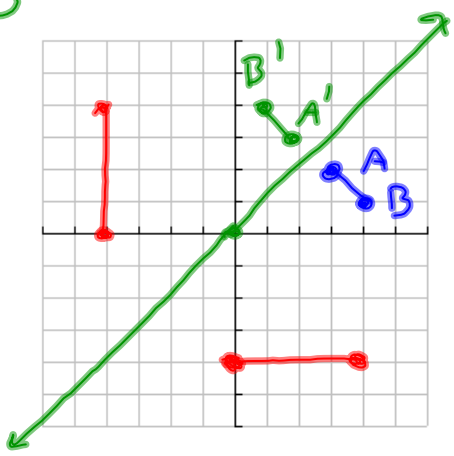


Ex 2 The endpoints of $\overline{AB}$ are $A(3, 2)$ and $B(4, 1)$. Reflect the segment in the line $y = x$.

$y = 1x + 0$

$A'(2, 3)$

$B'(1, 4)$

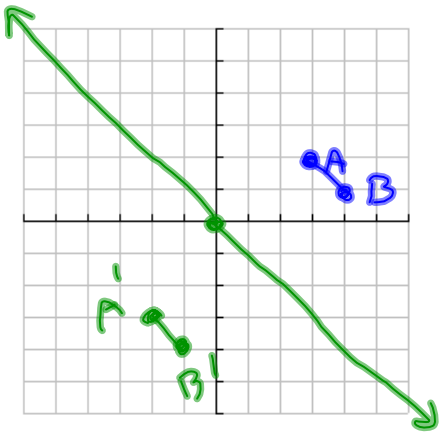


Ex 3 Reflect $\overline{AB}$ in the line $y = -x$.
The endpoints of $\overline{AB}$ are $A(3, 2)$ and $B(4, 1)$

$y = -1x + 0$

$A'(-2,-3)$

$B'(-1,-4)$



Reflection and Rotation Matricies

Reflect across the x-axis: multiply by $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$

Reflect across the y-axis: multiply by $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$

Rotate 90 degrees: multiply by $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$

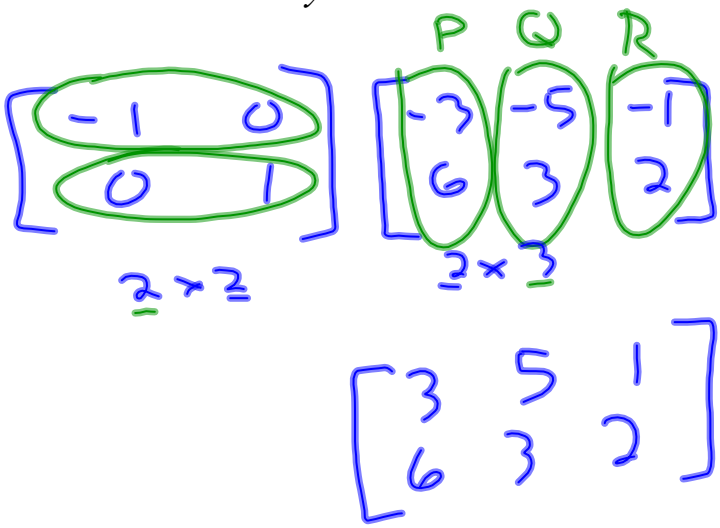
Rotate 180 degrees: multiply by $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$

Rotate 270 degrees: multiply by $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$

Rotate 360 degrees: multiply by $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Ex 4 Triangle *PQR*: (-3, 6) (-5, 3) (-1, 2)

Reflect this across the *y*-axis



$$\begin{bmatrix} 3 & 5 & 1 \\ 6 & 3 & 2 \end{bmatrix}$$

Ex 5 Triangle *RST*: (-1, 1) (-3, 3) (-4, 2)

Reflect this across the *x*-axis

$$\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} -1 & -3 & -4 \\ 1 & 3 & 2 \end{bmatrix} =$$

$$\begin{bmatrix} & & \end{bmatrix}$$

Ex. 6 The vertices of ΔABC are $A(5, 3)$, $B(2, 8)$, and $C(1, 1)$.

Reflect ΔABC in the y-axis.

Then reflect $\Delta A'B'C'$ in the line $y = 2$.