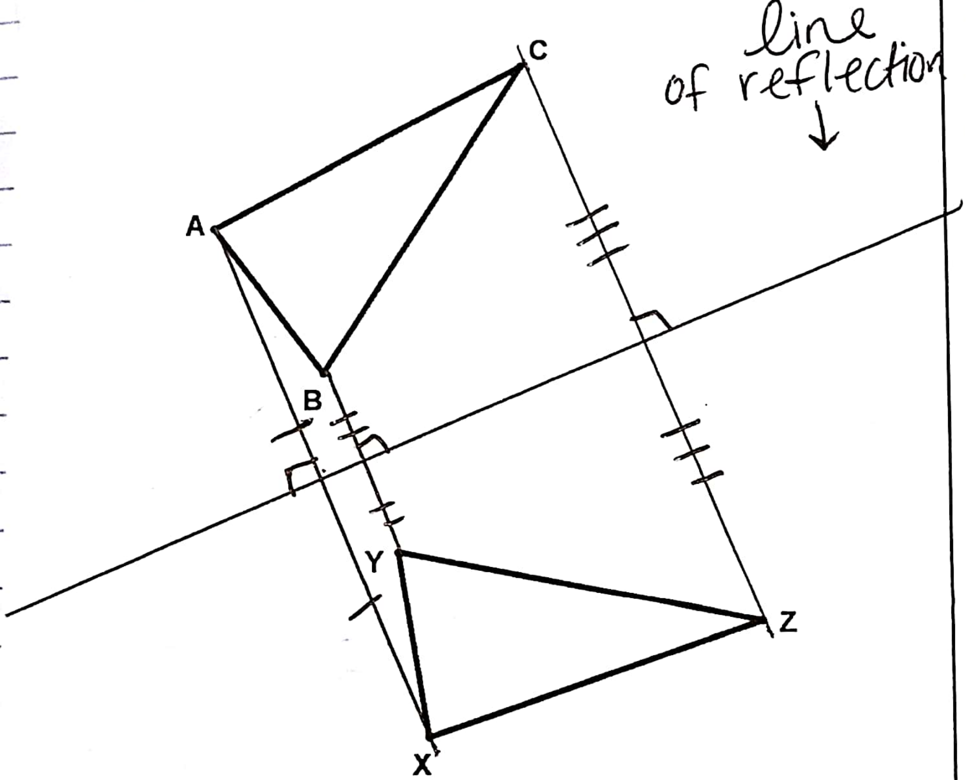
Reflections

Reflection Exploration

1) ΔABC and ΔXYZ are reflections of each other. While holding the paper towards the light, fold the paper so that the triangles coincide (line up on top of each other). Crease the fold. Then open your paper back up and trace over this fold line using a straightedge to keep it neat.



2) Using a straightedge, draw $\overline{AX}$, $\overline{BY}$, and $\overline{CZ}$. Look at each segment in relationship to the reflection line. What appears to be true about the reflection line? Discuss lengths of segments and angles created in relationship to the reflection line.

* The line of reflection is a perpendicular bisector *

Take away:

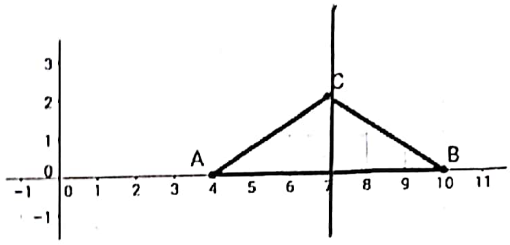
* Line of reflection is parallel to $\overline{AX}$, $\overline{BY}$ & $\overline{CZ}$

* The line of reflection is a bisector for $\overline{AX}$, $\overline{BY}$ & $\overline{CZ}$

Quadratic Functions

Reflection Symmetry

1. Given triangle ABC.



a. Draw the line of reflection that maps angle A onto angle B.

b. Write the **equation** of the line of reflection X=7

c. If we reflect triangle ABC over the line of reflection found in part a, $\overline{AC}$ maps to $\overline{CB}$.

d. What can we conclude about the measure of angle A and B?

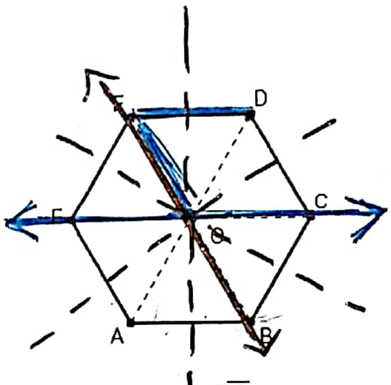
$\angle A \cong \angle B$

e. What can we conclude about the lengths of $\overline{AC}$ and $\overline{BC}$?

$\overline{AC} \cong \overline{BC}$

f. What kind of triangle is ABC?

Isosceles



2. Given regular hexagon ABCDEF.

a. List the three lines of symmetry drawn on the diagram at right:

$\overline{BE}$, $\overline{DA}$, $\overline{FC}$

b. What is the image of point D when reflected across $\overline{BE}$? F

c. What is the image of $\angle OED$ when reflected across $\overline{FC}$? What conclusions can you make about these angles?

$\angle OAB$

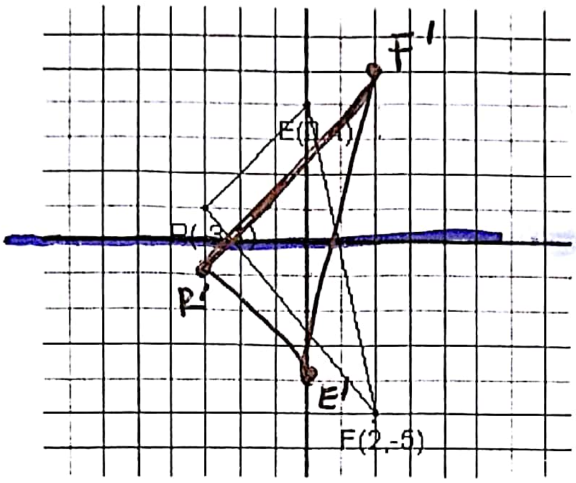
D. Draw the other 3 lines of symmetry not already shown on the diagram.

Reflection: A transformation in which the image is a mirror of the pre-image

Activity: Reflections in the coordinate plane.

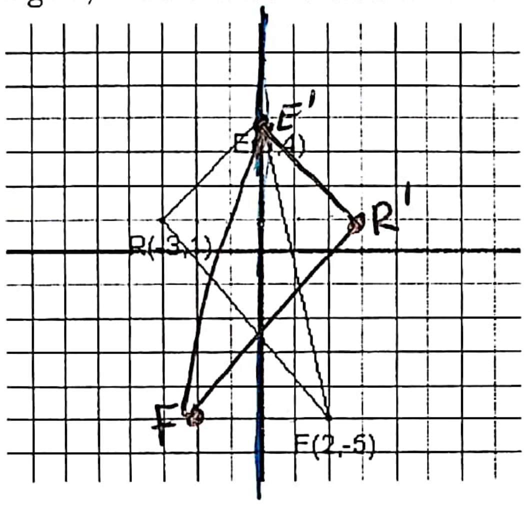
1. Given ΔREF: R(-3, 1), E(0, 4), F(2, -5)

On the first grid, draw the reflection of ΔREF in the x-axis.



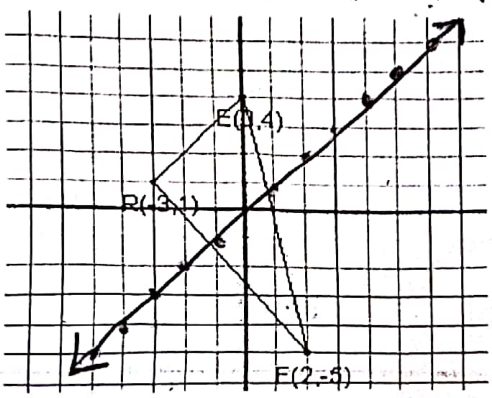
Record the new coordinates:
R'(-3 , -1), E'(0 , -4), F'(2 , 5)

2. On the second grid, draw the reflection of ΔREF in the y-axis.



Record the new coordinates:
R'(3 , 1), E'(0 , 4), F'(-2 , -5)

3. Graph the line y = x on the third coordinate grid. Trace ΔREF, both axes, and the line y = x on patty paper. Then flip the patty paper over and line it up again to see where the triangle's image would be if you reflected it in the line y = x. Record the new coordinates: R'(1 , -3), E'(4 , 0), F'(-5 , 2)



* x & y literally switch

- Reflection in the **x-axis** maps (x, y) → (x , -y)
- Reflection in the **y-axis** maps (x, y) → (-x , y)
- Reflection over both axes at once maps (x, y) → (-x , -y)
- Reflection in the line y = x maps (x, y) → (y , x)
- Reflection in the line y = -x maps (x, y) → (-y , -x)

- = opposite