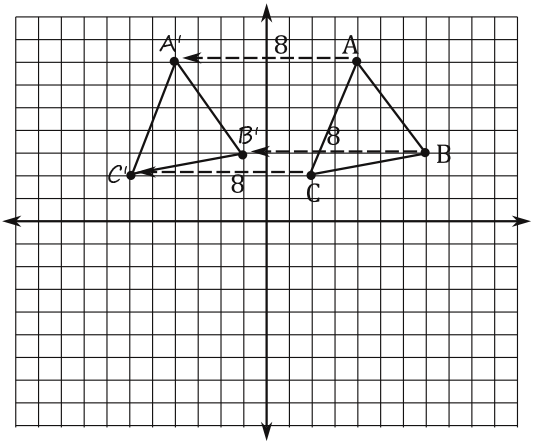
Transformations on the Coordinate Plane

Aka: a crazy mess...

Well okay, it's not too crazy, but it is a mess... The easiest way to see how to do these is to look at some examples. Make sure you study each one and read all the explanations before you start....

Ex. 1. Translate ΔABC 8 units to the left.

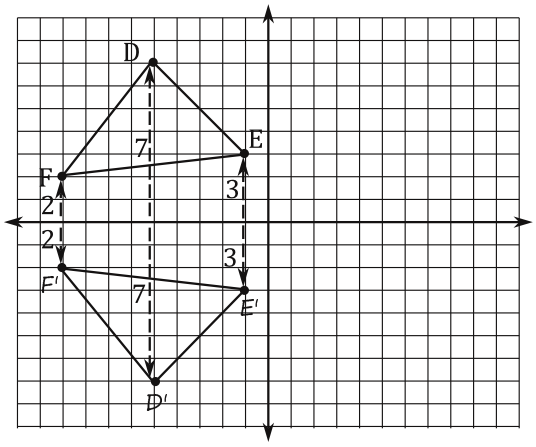


It's very easy to do this... First, start with A and count 8 units to the left and plot a point. Label this point A' ("A Prime"). Next, do this with all the other points. Last, connect them to form the new triangle.

The ' or "Prime" is simply a way to say "the new A" with less confusion and less words.

Sometimes these problems are written with a rule. This rule would be (x-8). It just means "take all the x coordinates and subtract 8 from them." (Which is just counting 8 to the left.)

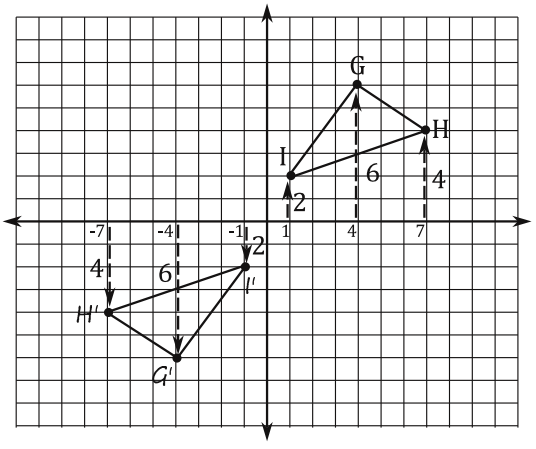
Ex. 2. Reflect ΔDEF over the x axis.



To do this it's, also very easy... First, start with D and count how many units it is away from the x axis. Then count that many units on the other side and plot a point and label it D'. Next, do this with all the other points. Last, connect them to form the new triangle.

Be very careful on this type to reflect it over the correct axis. Remember, the y axis goes up and down, and the x axis goes left and right. Always double check which axis you are supposed to be reflecting over.

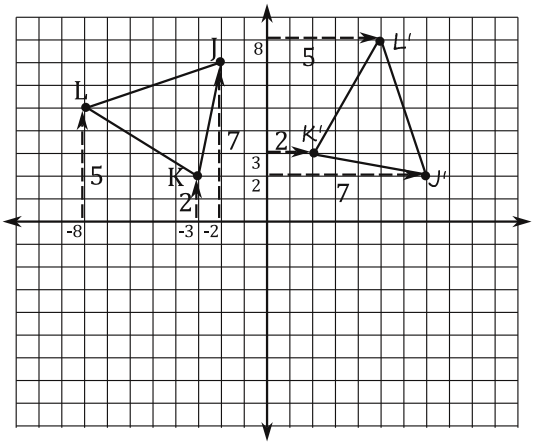
Ex. 3. Rotate ΔGHI 180° about the origin.



Now these get trickier... First, start with I. Count along the nearest axis the position of I, then go two axis to the left (or right for 180°). Pretend this is the axis you were just using. Plot it in the same position. Label it I'. Next, do this with all the other points. Last, connect them to form the new triangle.

The tricky part is to figure out how far to go.
Another method is to actually turn your paper 180°, and then see where the triangle is and plot the points.
We will do 90° clockwise, and counterclockwise as well.

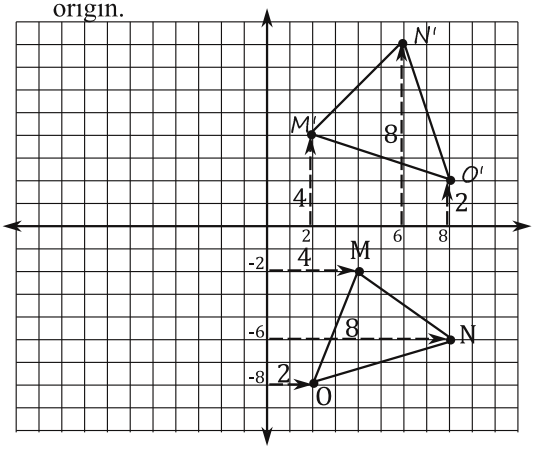
Ex. 4. Rotate ΔJKL 90° clockwise about the origin.



First, start with K. Count along the nearest axis the position of K then go one axis around the origin as the clock goes, and plot it in the same position. Label it K'. Next, do this with all the other points. Last, connect them to form the new triangle.
The tricky part is to figure out how far to go. Another method is to actually turn your paper 90° clockwise, and then see where the triangle is and plot the points.

We will do 90° counterclockwise as well.

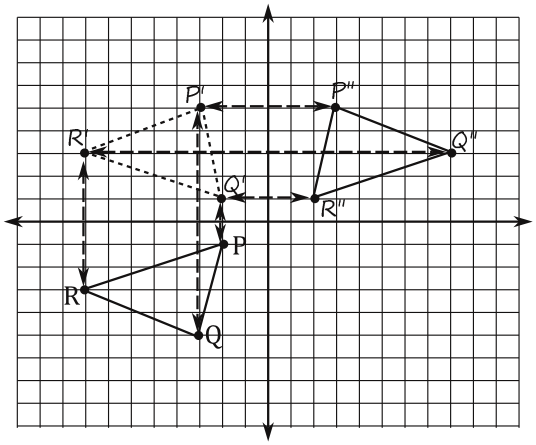
Ex. 5. Rotate ΔMNO 90° counterclockwise about the origin.



First, start with O. Count along the nearest axis the position of O. Then, go one axis to the left against the clock and plot it in the same position. Label it O'. Next, do this with all the other points. Last, connect them to form the new triangle.

Again, if you like to turn your paper you can do that too.

Ex. 6. Reflect ΔPQR over the x axis, then over the y axis.



This is known as a compound transformation. Just do the first thing it asks, first. Then do the second thing, and you are off to the races!

This one is a little weird, because when you do the first reflection you end up with P', Q', and R'. When you do the second you get P", Q" and R". The " means "double prime," so it is the third P, Q, and R. (It is the third because the original isn't prime or double prime.)

Let's sart the madness!...