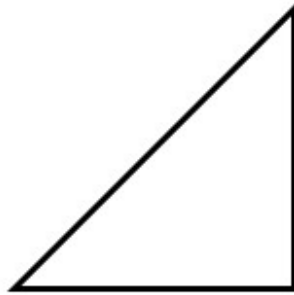# Discovering the Unit Circle

In this activity, you will use your knowledge about triangles and trigonometry to discover the unit circle that we will be using repeatedly throughout the remainder of the school year.

The triangle above is an isosceles right triangle.
1) Label all of the angles of the triangle.
2) Assign the 2 legs of the triangle to be a length of your choosing.
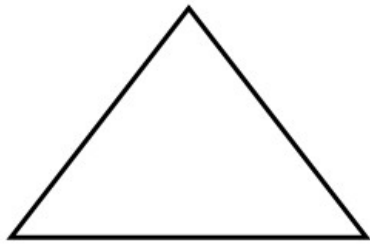3) Find the exact hypotenuse, use radical form if necessary.

4) The triangle above and the triangle below are similar triangles. What would you have to do in order to find the new side lengths if you were given that the new triangle has a hypotenuse of 1 unit? Explain the process and then label the angles and side lengths of the triangle below. Rationalize the denominators, if necessary!
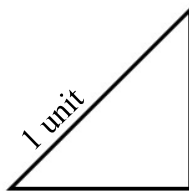
5) Assume that the radius of the circle below is one unit. Find the coordinates of point A when given the information below.
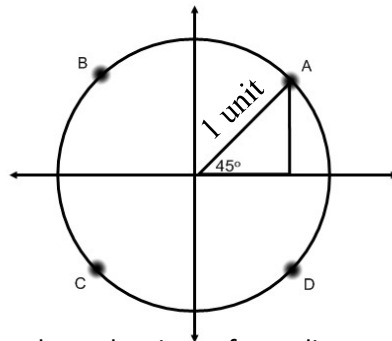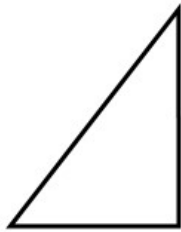
6) Use reflections and what you know about the signs of coordinate pairs in each quadrant to find the ordered pair for points B, C & D.

The triangle above is an equilateral triangle.
1) Label all of the angles of the triangle.
2) Label all of the side lengths with a length of your choosing.
3) Draw in the altitude of the triangle and find its exact length, use radical form if necessary.

4) The triangle below is the left half of the triangle from above. Fill in the angles and side lengths from above on the triangle below. Remember, it is only the left side of the altitude.

5) The triangle above and the triangle below are similar triangles. What would you have to do in order to find the new side lengths if you were given that the new triangle has a hypotenuse of 1 unit? Explain the process and then label the angles and side lengths of the triangle below. Rationalize the denominators, if necessary!
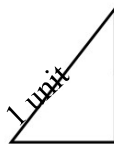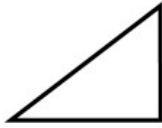
6) Assume that the radius of the circle below is one unit. Find the coordinates of point A when given the information below
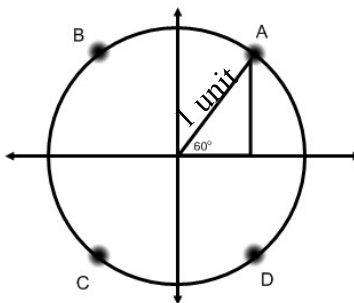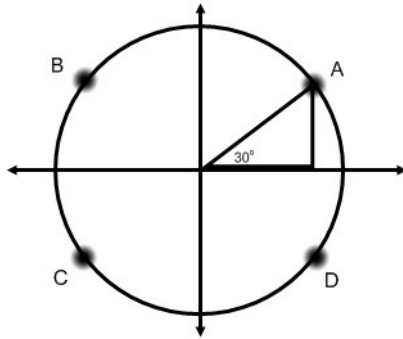
7) Use reflections and what you know about the signs of coordinate pairs in each quadrant to find the ordered pair for points B, C & D.

8) Rotate and reflect the triangle in #5 and use it to fill in the angles and side lengths of the triangle below.

9) Assume that the radius of the circle below is one unit. Find the coordinates of point A when given the information below.

10) Use reflections and what you know about the signs of coordinate pairs in each quadrant to find the ordered pair for points B, C & D.

Below you will find a 16-point unit circle. Draw in all of the triangles and label the coordinates of the points. Use different colors for each reference triangle. Use the triangle you have created in problems 5, 6, and 9.