INTRO TO TRIGONOMETRY
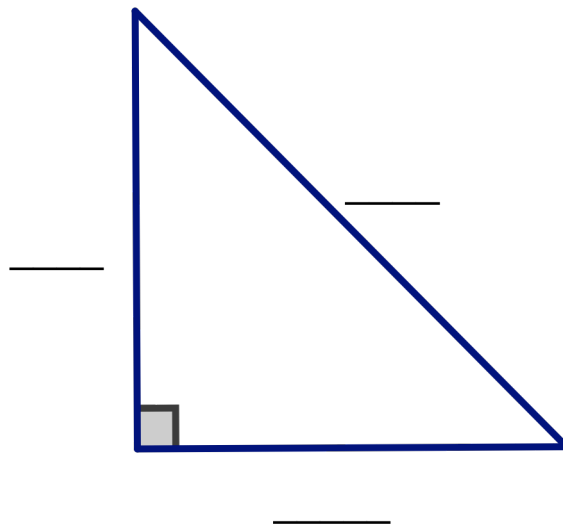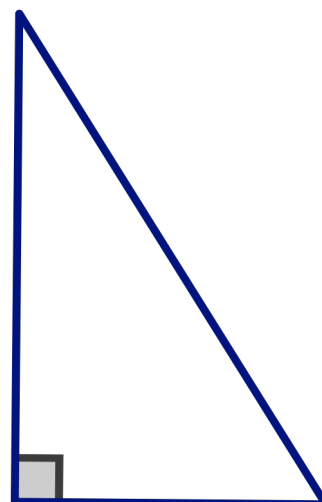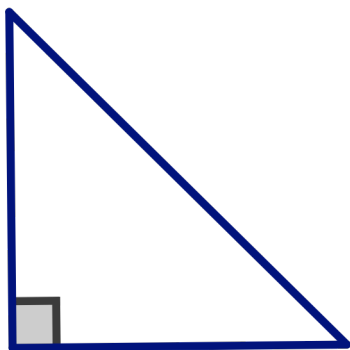
"Trig" means *triangle* in Greek. "Metry" means *measure* in Greek. Hence, Trigonometry is the study of triangles, which offers tools to solve triangles (i.e. missing sides and angles).

➔ Recall the Pythagorean Theorem: _____, where _____ & _____ refer to the _____ of a right triangle and _____ refers to the _____ of a right triangle.
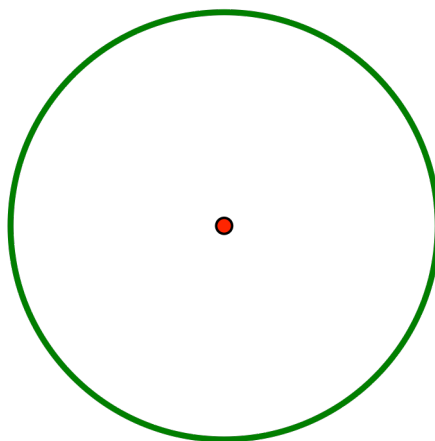
➔ In Geometry, recall two special right triangles: _____ & _____.
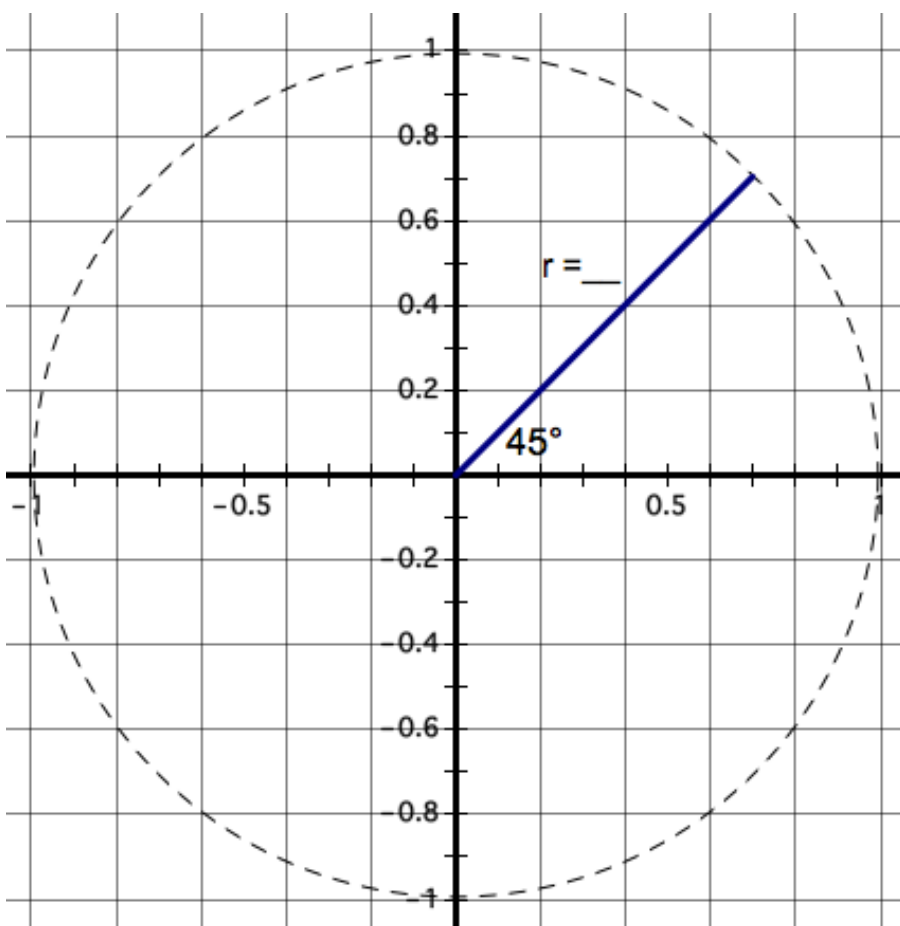
What's so "special" about these triangles?

➜ A unit circle is a circle with a radius measure of one unit.   A radius is defined as _____

_____.

A diameter is _____. Hence, $d =$ _____ and $r =$ _____.

➜ Special triangles can help to construct the unit circle. If we place the special triangles on an x-y
coordinate grid and solve for the missing sides, we can find coordinate points along the unit circle.

The radius is the same side as the
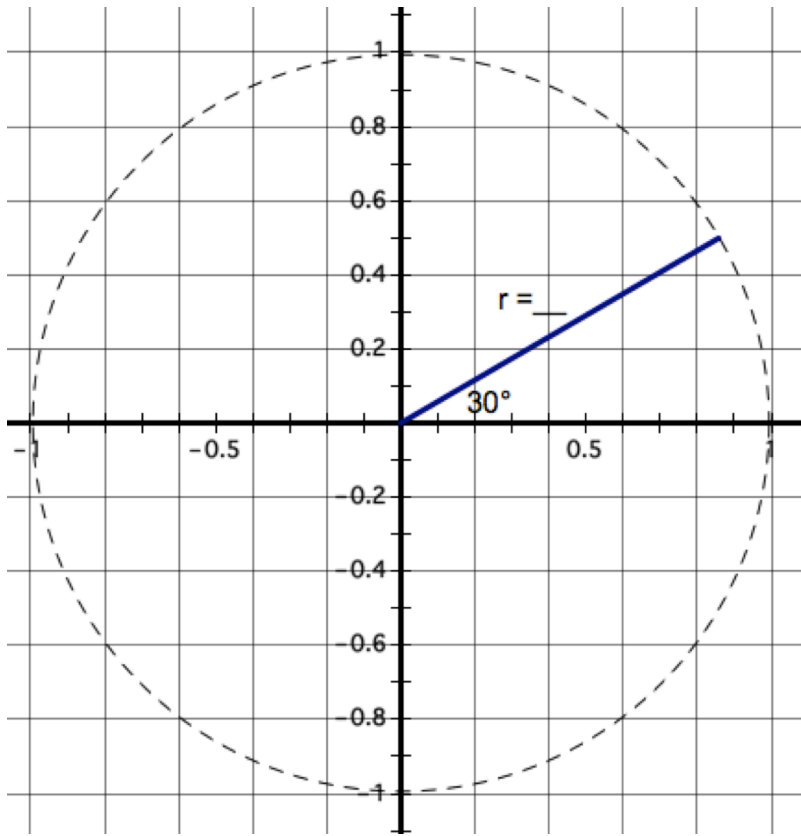_____ of
the triangle.

What is the length of the radius?

What do we know about the
lengths of the legs of a 90-45-45
triangle?

What can we use to solve for the
missing sides?

How does all of this help to
construct a unit circle?

30-60-90 right triangle also helps to construct a unit circle by giving more coordinate points on the unit circle.
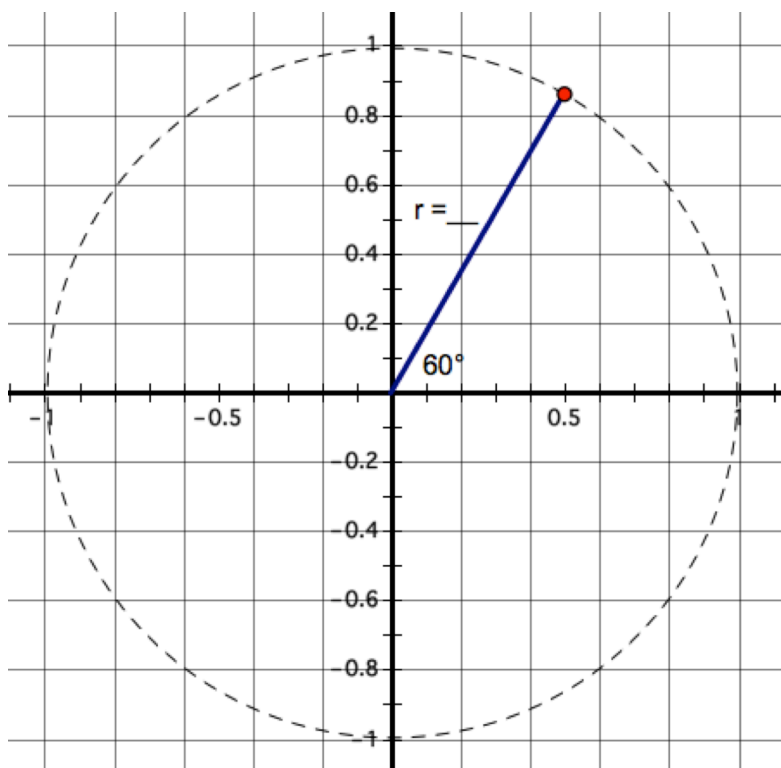

What is the length of the radius?

What tool in trigonometry can we use to find the lengths of the legs of the right triangle given one side and one angle?

What is another coordinate point on the unit circle?

If we turn the 30-60-90 on the other leg, we get......

Solve the 30-60-90 triangle. Then, find the coordinate point on the unit circle.

➔ By changing the orientation of special triangles on an x-y coordinate grid, and/or the use of symmetry, ample coordinate points can be plotted to construct a unit circle. Remember, changing the orientation of a figure does not change the angle measures or lengths of sides. The following steps can be used a guide to construct the unit circle.

1. Plot the intercepts.
2. Split up the circle by 45° angles.
3. Split up the circle by 30° angles.
4. Remember the signs of the four quadrants.
5. Based on our work beforehand, plot coordinate points in the first quadrants.
6. Using symmetry, we can plot the remaining coordinates and adjust the signs depending on the quadrant.