

The Unit Circle

The unit circle is a circle with a radius with length one unit. It is one of the basic concepts used in trigonometry and can be used in various ways. In this activity, we are going to explore various angles in degree and radian form using a unit circle.

Open your web browser to www.exploremath.com, click the link on the right-hand side that says “Trigonometry”, and then the link labeled “Unit Circle”. On the left-hand side of the webpage, there is a circle with a green sliding bar above it labeled θ (“theta”). This variable is going to represent our degrees and radians.

1. Activate the box labeled “Show reference triangle”.
2. Leave the button “no function” activated.
3. Leave the button “show curve” inactivated.
4. Activate “degrees” button.
5. The point on the circle is moved by placing your mouse on top it, holding down the left button on your mouse, and dragging the point.

Answer the following questions in degree measures between 0° and 360° :

1. For what degree measures are x and y equal to each other?
2. For what degree measures are x and y opposites of each other?
3. For what degree measures is the x length half of the length of the radius?
4. For what degree measures is the y length half of the length of the radius?
5. For what degree measures is y zero?
6. For what degree measures is x zero?

Fill in the chart below by moving the position of the dot on the circle and changing the activation of the button from degrees to radians:

Degrees	Radians	Degrees	Radians
0		210	
30		225	
45		240	
60		270	
90		300	
120		315	
135		330	
150		360	
180			