**Activity 6.1.7 Special Angles**

The circle below is divided into quarters and marked with the radian measure and degree measure for the central angles with its initial side on the *x*-axis. The angle is rotated counterclockwise. You can see that the fractions are simplified. It is customary to leave out the unit of measure “radian”. When we see an angle without a unit of measure, we assume the angle is measured in radians.

 

Example: Taking quarters of the circumference of the unit circle.

$$\frac{1}{4 }of 2π= \frac{1(2π)}{4}=\frac{π}{2}$$

$$\frac{2}{4 }of 2π= \frac{2(2π)}{4}=π$$

$$\frac{3}{4 }of 2π= \frac{3(2π)}{4}=\frac{3π}{2}$$

Whole distance around circle = 2π

1. Divide the circle below into eighths and mark the radian and degree measure for the central angles that have an initial side on the *x*-axis and that are rotated counterclockwise.



1. Divide the circle into sixths and mark the radian measure and degree measure of each angle around the circle. Show the various simplified forms of any fraction you obtain when you mark the angles.



1. Divide the circle into twelfths and mark the radian measure and degree measure of each angle around the circle. Show the various simplified forms of any fraction you obtain when you mark the angles in radians.



1. On the next page is a circle with radius 10 cm. Use a protractor to record all the angles you found above - halves, quarters, thirds, sixths and eighths of a circle. You may want to use one color for the quarters and another color for the thirds, etc. This circle will be a useful tool for you when you take a test or do your assignments. You will need it for Investigation 6.2.1 Unit Circle Definition of Trigonometric Functions. Use symmetry to simplify your work.



