

Precalculus Honors
Unit Circle

Name key
Date _____

Objective: To find the coordinates of special angles on the Unit Circle.

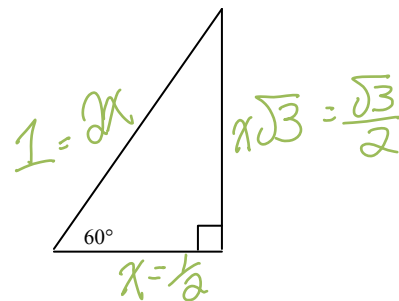
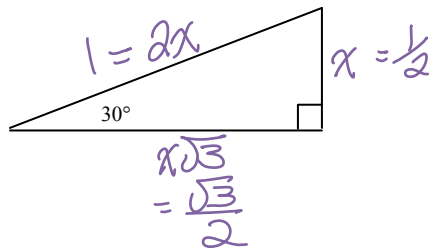
The **UNIT CIRCLE** has a radius length of one and its center is located at the origin.

\overrightarrow{OA} is the **initial** side of an **angle of rotation**. The **terminal** side passes through one of the other labeled points on the circle. Each rotation will be counterclockwise.

- Label **A** as 0° . Label the measures of points **E**, **I**, and **M**.
- Point **C** bisects \widehat{EA} . Label the degree measure for point **C**. Use this information to label the measures of the related three points in quadrants II, III, and IV.
- Draw \overline{OC} . Label its length. HINT: \overline{OC} is a radius.
- Draw a segment from **C**, perpendicular to the x-axis. Label the point of intersection, **R**. $\triangle OCR$ is an isosceles right triangle. Determine the lengths of the other two sides, \overline{OR} and \overline{RC} . Express your answer in simplest radical form. Rationalize the denominator. Use these numeric values to label the ordered pair coordinates of points **G**, **K**, and **Q**.
- Point **H** represents a counterclockwise rotation of 150° . Label the degree measures of points **B**, **J**, and **P**.
- Points **H** and **F** trisect \widehat{IE} . Label the degree measure of **F**, generated by a counterclockwise rotation from **A**. Then label the degree measures of **D**, **L**, and **N**.
- Label the EXACT, SIMPLIFIED lengths of the other two sides of each triangle below.

$$l = 2x$$

$$x = \frac{1}{2}$$



*also show
on unit
circle

- Label the coordinates of points **B**, **D**, **F**, **H**, **J**, **L**, **N**, and **P**.

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Fill in the chart. Use EXACT numbers. (no decimals)

Angle in Degrees	Angle in Radians	Coordinates of Corresponding point
0°	0	(1, 0)
30°	$\frac{\pi}{6}$	$(\frac{\sqrt{3}}{2}, \frac{1}{2})$
45°	$\frac{\pi}{4}$	$(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$
60°	$\frac{\pi}{3}$	$(\frac{1}{2}, \frac{\sqrt{3}}{2})$
90°	$\frac{\pi}{2}$	(0, 1)
120°	$\frac{2\pi}{3}$	$(-\frac{1}{2}, \frac{\sqrt{3}}{2})$
135°	$\frac{3\pi}{4}$	$(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$
150°	$\frac{5\pi}{6}$	$(-\frac{\sqrt{3}}{2}, \frac{1}{2})$
180°	π	(-1, 0)
210°	$\frac{7\pi}{6}$	$(-\frac{\sqrt{3}}{2}, -\frac{1}{2})$
225°	$\frac{5\pi}{4}$	$(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$
240°	$\frac{4\pi}{3}$	$(-\frac{1}{2}, -\frac{\sqrt{3}}{2})$
270°	$\frac{3\pi}{2}$	(0, -1)
300°	$\frac{5\pi}{3}$	$(\frac{1}{2}, -\frac{\sqrt{3}}{2})$
315°	$\frac{7\pi}{4}$	$(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$
330°	$\frac{11\pi}{6}$	$(\frac{\sqrt{3}}{2}, -\frac{1}{2})$
360°	2π	(1, 0)

UNIT CIRCLE

45-45-90°

