

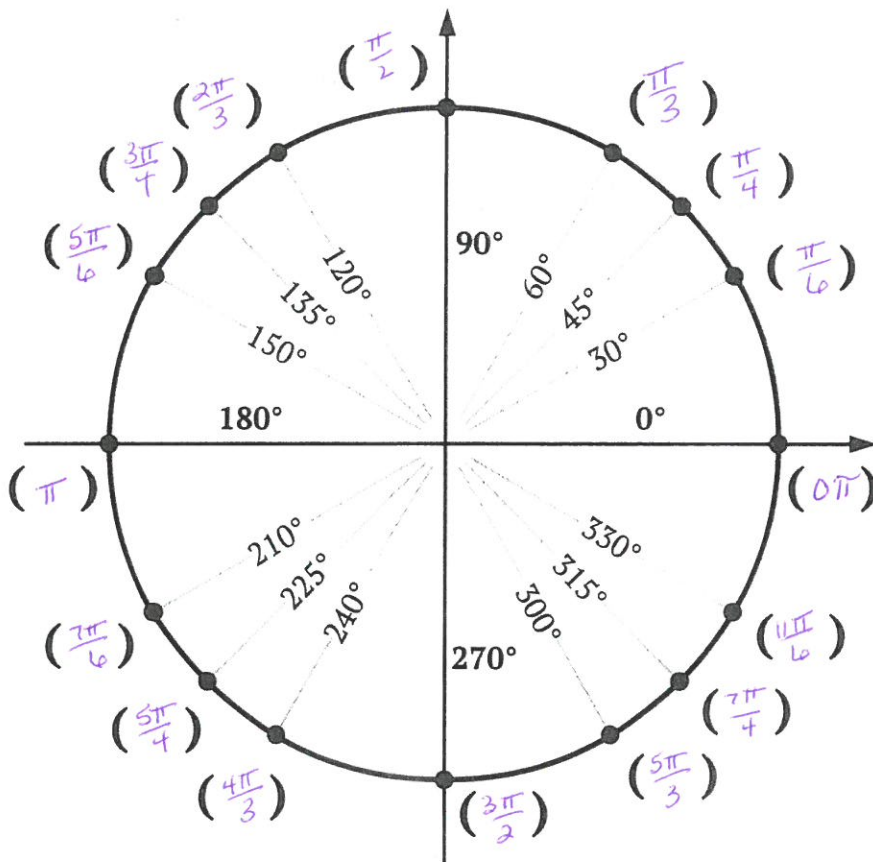
Section 3-4 Radian Measure and Degree Measure

*See Page 100

Consider a circle with radius r . One **radian** is the measure of an angle in standard position whose terminal side intercepts an arc of length r .

Since the circumference of a circle is $2\pi r$, there are 2π radians in a full circle.

So degrees and radians are related: $360^\circ = 2\pi$ $180^\circ = \pi$



Find the exact radian measure of the angle (no decimals). $\frac{\text{degrees}}{1} \cdot \frac{\pi \text{ rads}}{180 \text{ degrees}} = \pi \text{ rads}$

- | | | | |
|--|--|--|---|
| 1. 120°
$\frac{120^\circ}{1} \cdot \frac{\pi}{180^\circ} = \boxed{\frac{2\pi}{3}}$ | 2. 450°
$\frac{450^\circ}{1} \cdot \frac{\pi}{180^\circ} = \boxed{\frac{5\pi}{2}}$ | 3. -225°
$\frac{-225^\circ}{1} \cdot \frac{\pi}{180^\circ} = \boxed{\frac{5\pi}{4}}$ | 4. 105°
$\frac{105^\circ}{1} \cdot \frac{\pi}{180^\circ} = \boxed{\frac{7\pi}{12}}$ |
|--|--|--|---|

Find the exact degree measure of the angle given in radians. (no decimals) $\frac{\text{radians}}{1} \cdot \frac{180 \text{ deg}}{\pi \text{ rads}} = \text{degrees}$

- | | | |
|---|---|---|
| 5. $\frac{5\pi}{6}$
$\frac{5\pi}{6} \cdot \frac{180^\circ}{\pi} = 150^\circ$ | 6. 4π
$\frac{4\pi}{1} \cdot \frac{180^\circ}{\pi} = 720^\circ$ | 7. $-\frac{\pi}{2}$
$\frac{-\pi}{2} \cdot \frac{180^\circ}{\pi} = \boxed{-90^\circ}$ |
|---|---|---|

Find the degree measure in decimal form of the angle given in radians.

8. 3 radians

$$\frac{3 \text{ rads}}{1} \cdot \frac{180 \text{ deg}}{\pi \text{ rads}} = \frac{540^\circ}{\pi}$$

$$= 171.89^\circ$$

9. 0.62 radians

$$\frac{0.62 \text{ rads}}{1} \cdot \frac{180 \text{ deg}}{\pi \text{ rads}} = \frac{111.6^\circ}{\pi}$$

$$= 35.52^\circ$$

Find the function value (in decimal form) for the angle in radians.

10. $\cos 2 = -0.4161$

11. $\cot 4$

$$\frac{1}{\tan 4} = 0.8637$$

* put calc. in radian mode

** Would you know where these angles are w/out converting to degrees?

Find the radian measure (decimal form) of the angle.

12. $\tan^{-1} 5 = 1.37 \text{ rads}$

13. $\csc^{-1} 20.6 \rightarrow \sin^{-1} \left(\frac{1}{20.6} \right) = 0.0486$

$$\csc \theta = 20.6$$

$$\frac{1}{\sin \theta} = 20.6$$

$$\sin \theta = \frac{1}{20.6}$$

* note: $\cos 15$ and $\cos 15^\circ$ are different!

** which is why you must label when using degrees.