# 1.12 Trig Functions

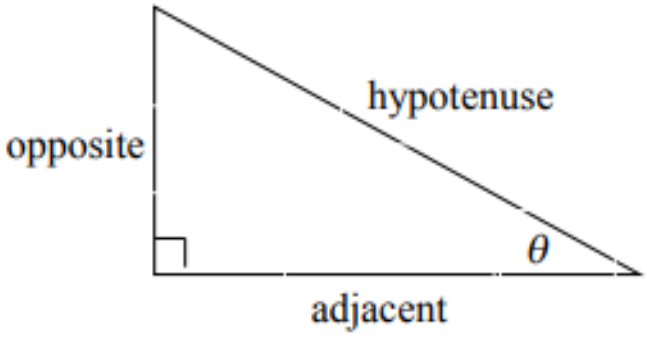
Angle Measure:

| | |
|---|---|
| Degrees: ° | $1° = \frac{1}{360}$ of a circle |
| Radian: rad | $1\,rad = \frac{1}{2\pi}$ of a circle |

To Convert: If in degrees, Multiply the number by $\frac{\pi}{180}$. If in radians, multiply the number by $\frac{180}{\pi}$

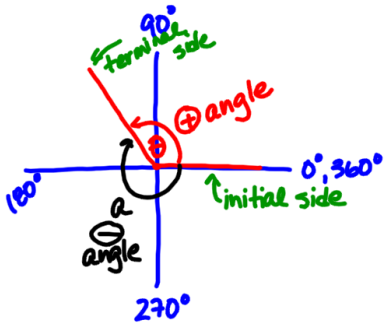
Examples: Convert the following:

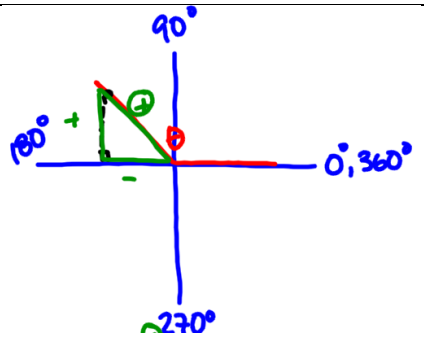
| | |
|---|---|
| 1. $165°$ to radians $= \frac{11\pi}{12}$ | 2. $\frac{5\pi}{6}$ to degrees $= 150°$ |




| | | |
|---|---|---|
| $\sin\theta = \frac{opposite}{hypotentuse} = \frac{1}{\csc\theta}$ | $\cos\theta = \frac{adjacent}{hypotentuse} = \frac{1}{\sec\theta}$ | $\tan\theta = \frac{opposite}{adjacent} = \frac{\sin\theta}{\cos\theta} = \frac{1}{\cot\theta}$ |
| $\csc\theta = \frac{hyp}{opp} = \frac{1}{\sin\theta}$ | $\sec\theta = \frac{hyp}{adj} = \frac{1}{\cos\theta}$ | $\cot\theta = \frac{adj}{opp} = \frac{\cos\theta}{\sin\theta} = \frac{1}{\tan\theta}$ |

Finding Trig Ratios Greater than 90.

| | |
|---|---|
|  | Standard Position: Vertex at origin initial side along the positive horizontal axis. |

| | |
|---|---|
|  | To find trig functions of $\theta$<br>1. Extend a line from terminal side to the nearest point on the horizontal axis.<br>2. The right triangle formed is the reference triangle.<br>3. The trig ratios of the reference triangle are the trig ratios of $\theta$. |

Periodic Function: A function $f(x)$ is periodic if there is a positive number $p$ such that $f(x+p) = f(x)$ for every value $x$. The smallest such value of $p$ is the period of f.

| Transformations on Trigonometric Graphs | |
|---|---|
| $f(x) = a\sin\big(b(x-c)\big) + d$ | |
| $\lvert a\rvert$ is the amplitude | $\lvert b\rvert$ influences the period |
| $c$ is the horizontal shift | $d$ is the vertical shift |