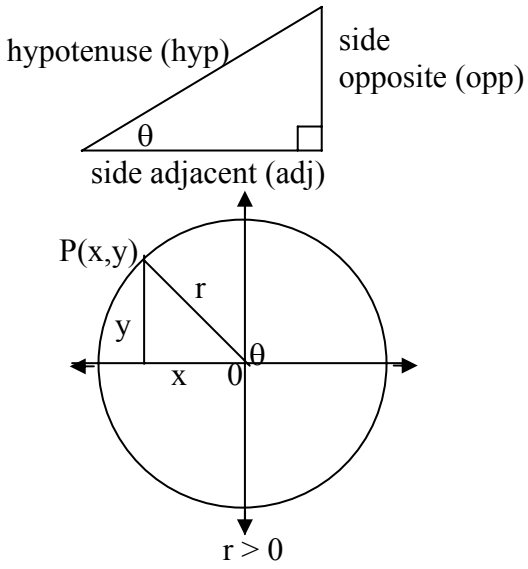
Trigonometric Functions

Definitions of the Trigonometric Functions

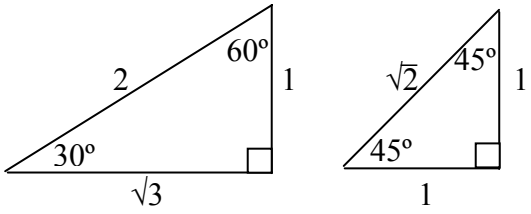
	On right triangle	On circle, radius r	On unit circle (r = 1)
sin θ	$\frac{opp}{hyp}$	$\frac{y}{r}$	y
cos θ	$\frac{adj}{hyp}$	$\frac{x}{r}$	x
tan θ	$\frac{opp}{adj}$	$\frac{y}{x}$	$\frac{y}{x}$
cot θ	$\frac{adj}{opp}$	$\frac{x}{y}$	$\frac{x}{y}$
sec θ	$\frac{hyp}{adj}$	$\frac{r}{x}$	$\frac{1}{x}$
csc θ	$\frac{hyp}{opp}$	$\frac{r}{y}$	$\frac{1}{y}$



Signs of the Trigonometric Functions

Quadrant	sin	cos	tan	cot	sec	csc
I	+	+	+	+	+	+
II	+	-	-	-	-	+
III	-	-	+	+	-	-
IV	-	+	-	-	+	-

Important Reference Triangles



For $y = a \sin(bx - c) + d$ or $y = a \cos(bx - c) + d$

Amplitude = $|a|$ Period = $\frac{2\pi}{|b|}$

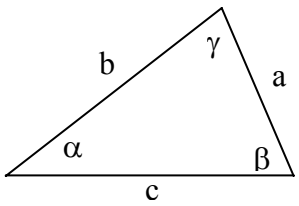
Phase Shift = $\frac{c}{b}$ Vertical Shift = d

For: $y = a \tan(bx - c) + d$

Amplitude = $|a|$ Period = $\frac{\pi}{|b|}$ Phase Shift = $\frac{c}{b}$ Vertical Shift = d

Successive vertical asymptotes solve:

$bx + c = \frac{-\pi}{2}$ & $bx + c = \frac{\pi}{2}$



Law of Sines: $\frac{a}{\sin\alpha} = \frac{b}{\sin\beta} = \frac{c}{\sin\gamma}$

Law of Cosines: $c^2 = a^2 + b^2 - 2ab\cos\gamma$

$b^2 = a^2 + c^2 - 2ac\cos\beta$

$a^2 = b^2 + c^2 - 2bc\cos\alpha$