Trigonometry - Formulas and Special Values

	$\frac{\pi}{6} = 30°$	$\frac{\pi}{4} = 45°$	$\frac{\pi}{3} = 60°$
$\sin(t)$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$
$\cos(t)$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$
$\tan(t)$	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$

$$\sin(t) = \frac{y}{r} = \frac{\text{opp}}{\text{hyp}}$$
$$\cos(t) = \frac{x}{r} = \frac{\text{adj}}{\text{hyp}}$$
$$\tan(t) = \frac{y}{x} = \frac{\text{opp}}{\text{adj}}$$
$$\csc(t) = \frac{r}{y} = \frac{\text{hyp}}{\text{opp}}$$
$$\sec(t) = \frac{r}{x} = \frac{\text{hyp}}{\text{adj}}$$
$$\cot(t) = \frac{x}{y} = \frac{\text{adj}}{\text{opp}}$$

$$\csc(t) = \frac{1}{\sin(t)}$$
$$\sec(t) = \frac{1}{\cos(t)}$$
$$\tan(t) = \frac{\sin(t)}{\cos(t)}$$
$$\cot(t) = \frac{1}{\tan(t)}$$
$$\cot(t) = \frac{\cos(t)}{\sin(t)}$$

$$\sin^2(t) + \cos^2(t) = 1$$
$$\tan^2(t) + 1 = \sec^2(t)$$
$$1 + \cot^2(t) = \csc^2(t)$$

$$\sin(-t) = -\sin(t)$$
$$\cos(-t) = \cos(t)$$
$$\tan(-t) = -\tan(t)$$
$$\csc(-t) = -\csc(t)$$
$$\sec(-t) = \sec(t)$$
$$\cot(-t) = -\cot(t)$$

$$\sin(x+y) = \sin(x)\cos(y) + \cos(x)\sin(y)$$
$$\cos(x+y) = \cos(x)\cos(y) - \sin(x)\sin(y)$$
$$\tan(x+y) = \frac{\tan(x) + \tan(y)}{1 - \tan(x)\tan(y)}$$

$$\sin(x-y) = \sin(x)\cos(y) - \cos(x)\sin(y)$$
$$\cos(x-y) = \cos(x)\cos(y) + \sin(x)\sin(y)$$
$$\tan(x-y) = \frac{\tan(x) - \tan(y)}{1 + \tan(x)\tan(y)}$$

$$\sin(2x) = 2\sin(x)\cos(x)$$
$$\cos(2x) = \cos^2(x) - \sin^2(x)$$
$$\cos(2x) = 1 - 2\sin^2(x)$$
$$\cos(2x) = 2\cos^2(x) - 1$$
$$\tan(2x) = \frac{2\tan(x)}{1 - \tan^2(x)}$$

$$\sin^2(x) = \frac{1 - \cos(2x)}{2}$$
$$\cos^2(x) = \frac{1 + \cos(2x)}{2}$$
$$\tan^2(x) = \frac{1 - \cos(2x)}{1 + \cos(2x)}$$

$$\sin\left(\frac{x}{2}\right) = \pm\sqrt{\frac{1 - \cos(x)}{2}}$$
$$\cos\left(\frac{x}{2}\right) = \pm\sqrt{\frac{1 + \cos(x)}{2}}$$
$$\tan\left(\frac{x}{2}\right) = \pm\sqrt{\frac{1 - \cos(x)}{1 + \cos(x)}}$$
$$\tan\left(\frac{x}{2}\right) = \frac{1 - \cos(x)}{\sin(x)}$$
$$\tan\left(\frac{x}{2}\right) = \frac{\sin(x)}{1 + \cos(x)}$$

Law of Sines: $\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$	Law of Cosines: $a^2 = b^2 + c^2 - 2bc\cos(A)$