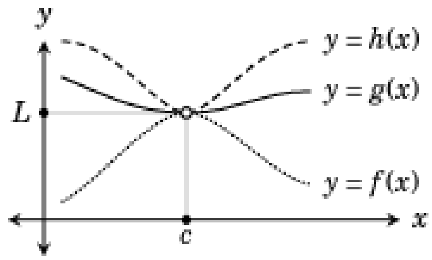
(The Squeeze Theorem)

Suppose we need to compute $\lim_{x\to c} g(x)$. Suppose also that we can find two functions $f(x)$ and $h(x)$ for which $f(x) \le g(x) \le h(x)$ for values of x near c, and for which $\lim_{x\to c} f(x) = L = \lim_{x\to c} h(x)$. Then $\lim_{x\to c} g(x) = L$.



$\lim_{x\to c} \sin(x) = \sin(c)$ for all real numbers c

$\lim_{x\to c} \cos(x) = \cos(c)$ for all real numbers c

$\lim_{x\to c} \tan(x) = \tan(c)$ for all real numbers $c \ne \frac{\pi}{2} + k\pi$

$\lim_{x\to c} \sec(x) = \sec(c)$ for all real numbers $c \ne \frac{\pi}{2} + k\pi$

$\lim_{x\to c} \cot(x) = \cot(c)$ for all real numbers $c \ne k\pi$

$\lim_{x\to c} \csc(x) = \csc(c)$ for all real numbers $c \ne k\pi$

$$\lim_{x\to 0}\left(\frac{\sin x}{x}\right) = 1 \qquad \lim_{x\to 0}\left(\frac{x}{\sin x}\right) = 1$$

$$\lim_{x\to 0}\left(\frac{1-\cos x}{x}\right) = 0$$

Reciprocal Identities :

$\sin\theta = \frac{1}{\csc\theta}$ $\quad \csc\theta = \frac{1}{\sin\theta}$

$\cos\theta = \frac{1}{\sec\theta}$ $\quad \sec\theta = \frac{1}{\cos\theta}$

$\tan\theta = \frac{1}{\cot\theta}$ $\quad \cot\theta = \frac{1}{\tan\theta}$

Pythagorean Identities :

$\sin^2\theta + \cos^2\theta = 1$

$1 + \tan^2\theta = \sec^2\theta$

$1 + \cot^2\theta = \csc^2\theta$

Cofunction Identities :

$\sin\theta = \cos\left(\frac{\pi}{2} - \theta\right)$, $\cos\theta = \sin\left(\frac{\pi}{2} - \theta\right)$

$\sec\theta = \csc\left(\frac{\pi}{2} - \theta\right)$, $\csc\theta = \sec\left(\frac{\pi}{2} - \theta\right)$

$\tan\theta = \cot\left(\frac{\pi}{2} - \theta\right)$, $\cot\theta = \tan\left(\frac{\pi}{2} - \theta\right)$

Even Odd Identities :

$\sin(-\theta) = -\sin\theta$, $\csc(-\theta) = -\csc\theta$

$\tan(-\theta) = -\tan\theta$, $\cot(-\theta) = -\cot\theta$

$\cos(-\theta) = \cos\theta$, $\sec(-\theta) = \sec t\theta$

Quotient Identities :

$\tan\theta = \frac{\sin\theta}{\cos\theta}$ $\quad \cot\theta = \frac{\cos\theta}{\sin\theta}$

Degrees	0°	30°	45°	60°	90°
Radians	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	DNE

$$\sin(\alpha+\beta) = \sin\alpha\,\cos\beta + \cos\alpha\,\sin\beta$$
$$\cos(\alpha+\beta) = \cos\alpha\,\cos\beta - \sin\alpha\,\sin\beta$$
$$\sin(\alpha-\beta) = \sin\alpha\,\cos\beta - \cos\alpha\,\sin\beta$$
$$\cos(\alpha-\beta) = \cos\alpha\,\cos\beta + \sin\alpha\,\sin\beta$$

$$\sin(\pi-\theta) = \sin\theta$$
$$\cos(\pi-\theta) = -\cos\theta$$
$$\tan(\pi-\theta) = -\tan\theta$$

$$\sin 2\theta = 2\sin\theta\cos\theta$$

$$\tan 2\theta = \frac{2\tan\theta}{1-\tan^2\theta}$$
$$\tan(\alpha+\beta) = \frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}$$
$$\tan(\alpha-\beta) = \frac{\tan\alpha-\tan\beta}{1+\tan\alpha\tan\beta}$$

$$\cos 2\theta = \cos^2\theta - \sin^2\theta = 2\cos^2\theta - 1 = 1 - 2\sin^2\theta$$

$$\sin\frac{\theta}{2} = \pm\sqrt{\frac{1-\cos\theta}{2}}$$
$$\cos\frac{\theta}{2} = \pm\sqrt{\frac{1+\cos\theta}{2}}$$
$$\tan\frac{\theta}{2} = \frac{\sin\theta}{1+\cos\theta} = \frac{1-\cos\theta}{\sin\theta}$$