Tangent function facts:

- $y = \tan \omega x \qquad period = \frac{\pi}{\omega}$

- $\tan x = \frac{\sin x}{\cos x}, \quad \therefore \; when \; \sin x = 0, \quad \tan x = 0$

    $when \; \cos x = 0, \quad \tan x \; is \; undefined!$

- Tangent graph will have asymptotes at values of x where the function is undefined:

    $x = \frac{\pi}{2} \; and -\frac{\pi}{2}.$
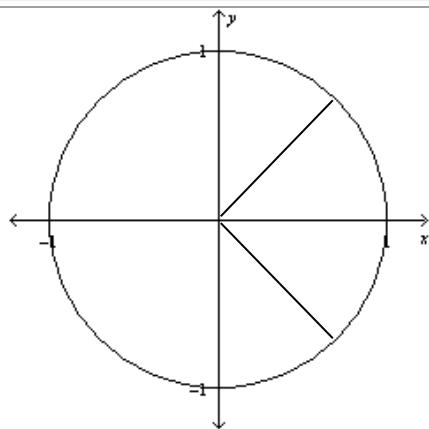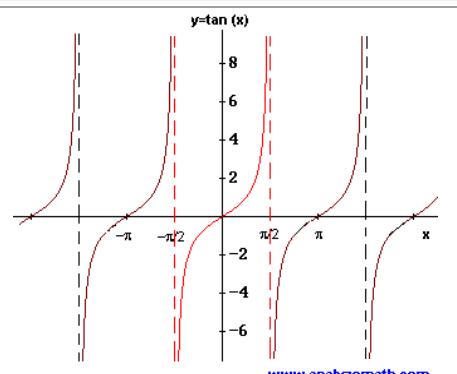
Domain: all real numbers except odd mult. of $\frac{\pi}{2}$

Range: $(-\infty, \infty)$

Period: π $\qquad \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

| input x	$-\frac{\pi}{2}$	$-\frac{\pi}{4}$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$
$y = tanx$					

Cotangent function facts:

- $y = \cot \omega x \qquad period = \dfrac{\pi}{\omega}$
- $\cot x = \dfrac{\cos x}{\sin x} \quad \therefore when \cos x = 0, \quad \cot x = 0$
- $\qquad\qquad\qquad when \sin x = 0, \quad \cot x\ is\ undefined$
- Asymptotes are found at π and multiples of π.

Period: π $\qquad (0, \pi)$

input x	0	$\dfrac{\pi}{4}$	$\dfrac{\pi}{2}$	$\dfrac{3\pi}{4}$	π
$y = cot\theta$					

y = cot (x)
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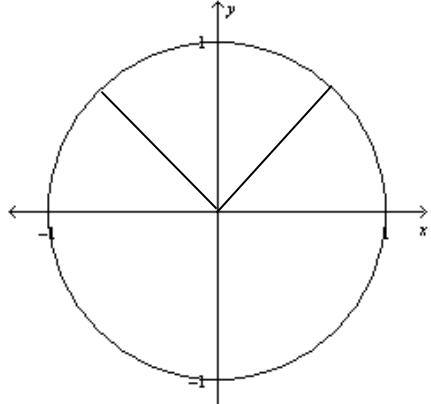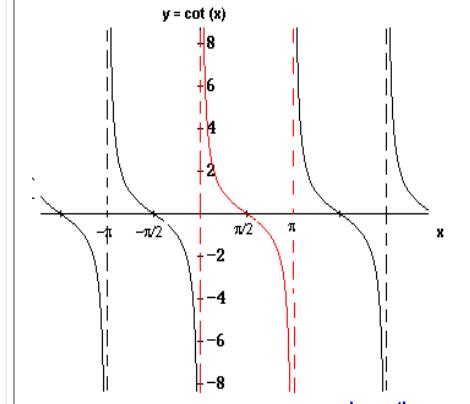
Domain: all real numbers except mult. of π

Range: $(-\infty, \infty)$

The same process used for sine and cosine may be followed for these trig functions. First let's look at the equations:

$$y = A\,\tan(\omega x) + B \qquad period = \frac{\pi}{\omega} \qquad y = A\cot(\omega x) + B$$

For tangent an appropriate interval is $\left(-\frac{\pi}{2\omega}, \frac{\pi}{2\omega}\right)$

for cotangent and appropriate interval is: $\left(0, \frac{\pi}{\omega}\right)$

The intervals are bounded by vertical asymptotes.

$$y = 2\tan x - 1$$
$$T = \qquad\qquad A =$$

x					
$\tan x$					
$2\tan x$					
$2\tan x$ -1					
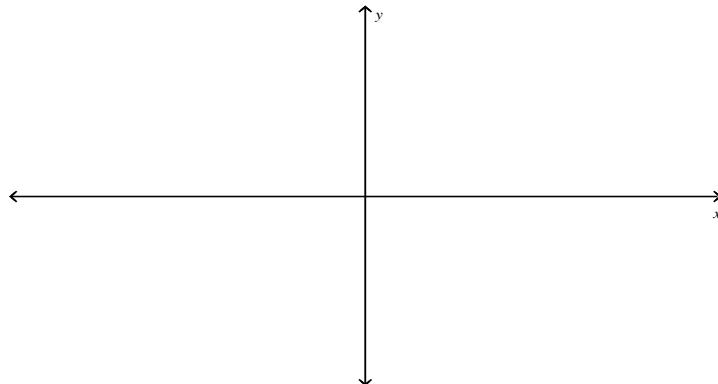
$$y = 3\tan(2x)$$
$$period = \qquad A =$$

x					
$2x$					
$\tan 2x$					
$3\tan 2x$					
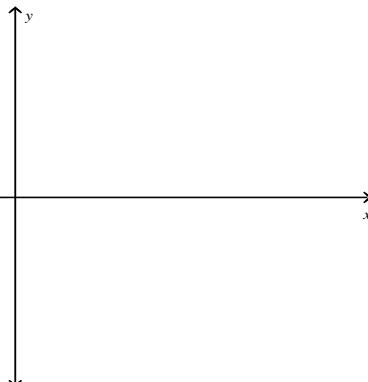
$$y = A\cot(\omega x) + B \qquad period = \frac{\pi}{\omega} \qquad \text{For cotangent and appropriate interval is: } \left(0, \frac{\pi}{\omega}\right).$$

$$y = \cot x + 2$$

x					
$\cot x$					
$\cot x + 2$					