4.6 Graphs of Other Trig Functions
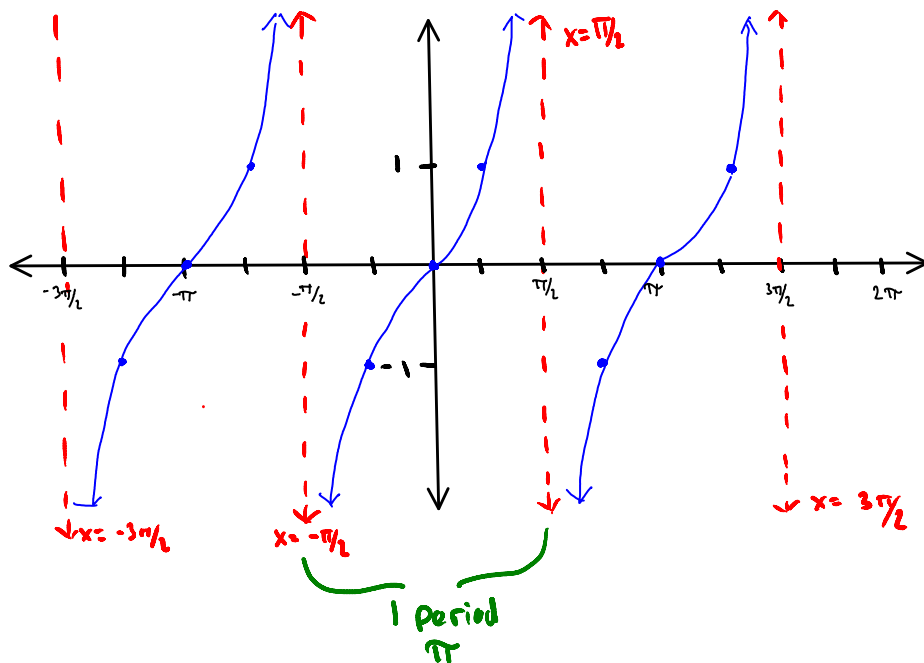
Graph of Tangent Function $y = \tan x$ $y = a\tan(bx - c)$

- Tan funct. is "odd" $[\tan(-x) = -\tan(x)]$
- Graph of tan funct. is symmetric to the origin
- Tan funct. is **UNDEFINED** when $\cos x = 0$

$$\tan = \frac{\sin}{\cos}$$

- Period of tan is π
- Domain is $\mathbb{R}$ except $x = \frac{\pi}{2} + n\pi$
- Range is $(-\infty, \infty)$
- Vertical Asymptotes are $-\pi/2, \pi/2$ for 1 period $[x = \#]$

1 period
π

Two consecutive asymptotes can be found by solving the eqn:

$$bx - c = -\frac{\pi}{2} \quad \text{and} \quad bx - c = \frac{\pi}{2}$$

The mid-point between the asymptotes is the x-intercept.

After plotting the asymptotes and the x-intercept, plot a few additional points between the asymptotes then sketch the cycle.

Ex.1   Sketch the function

a) $y = \tan \dfrac{x}{2}$; 1 period

$per = \dfrac{\pi}{b}$

$per = \dfrac{\pi}{\frac{1}{2}}$
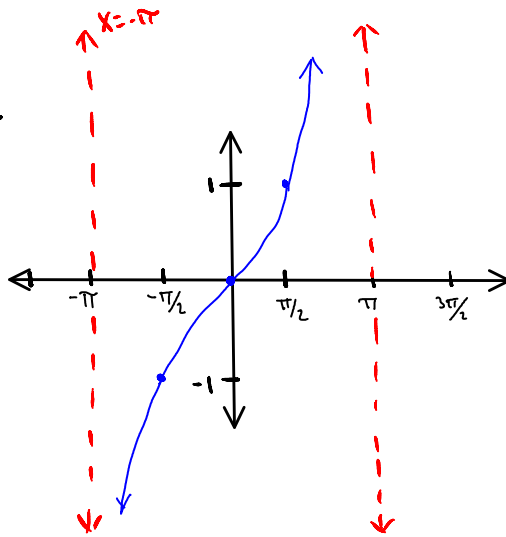
$per = 2\pi$

x = -π

Table Set

* change table the ΔTbl to $\dfrac{\pi}{2}$ intervals. This enables you to view your table in increments of $\dfrac{\pi}{2}$.

Find Asymptotes

$bx - c = -\dfrac{\pi}{2}$	$bx - c = \dfrac{\pi}{2}$
$\dfrac{x}{2} = -\dfrac{\pi}{2}$	$\dfrac{x}{2} = \dfrac{\pi}{2}$
$x = -\pi$	$x = \pi$

mid-point is x-intercept

x	-π	-π/2	0	π/2	π
tan x/2	und	-1	0	1	und