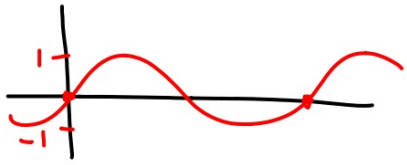
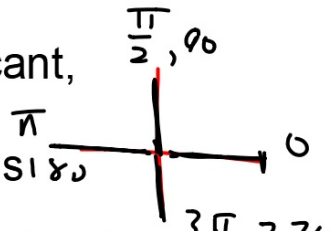
Trig 6.7



Graph tangent, cotangent, secant, cosecant functions

Write equations of trig functions



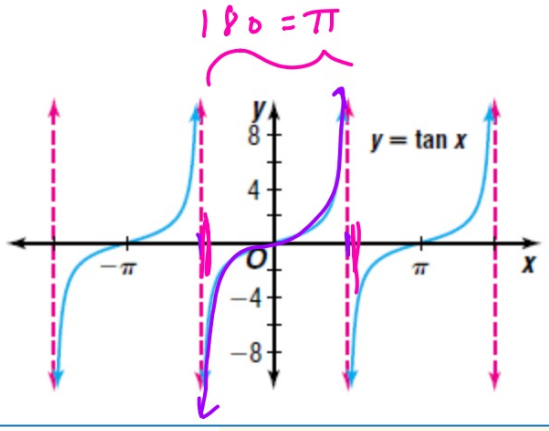
$\frac{1}{\tan} = \cot$ tangent = $\frac{opp}{adj} = \frac{y}{x}$ undef. @

$\frac{1}{\cot} = \tan$ cotangent = $\frac{adj}{opp} = \frac{x}{y}$ undef @ $0, \pi$

reciprocal

- secant $\frac{1}{\cos}$
- cosecant $\frac{1}{\sin}$

Graph by hand:
y= tan(x)

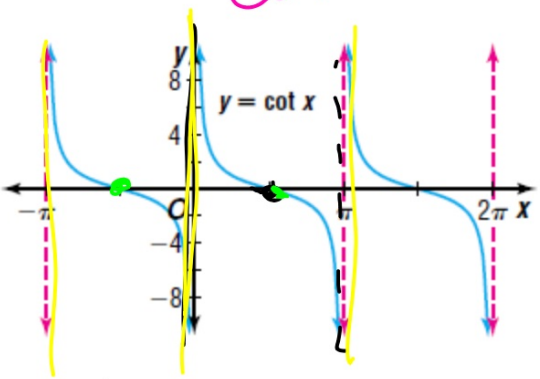


Now back to radians

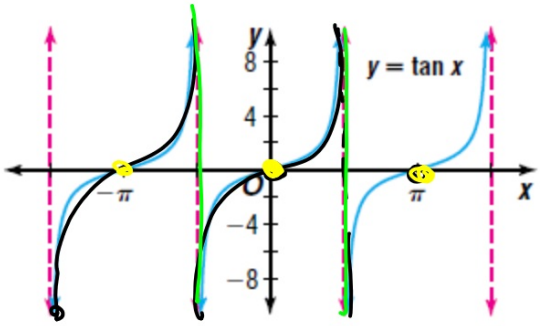
Properties of the Graph $y = \tan x$

1. The period is π.
2. The domain is the set of real numbers except $\frac{\pi}{2}n$, where n is an odd integer.
3. The range is the set of real numbers.
4. The x-intercepts are located at πn, where n is an integer.
5. The y-intercept is 0.
6. The asymptotes are $x = \frac{\pi}{2}n$, where n is an odd integer.

Cot



tan



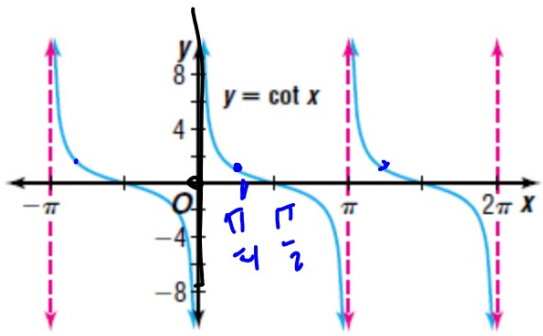
int & undef trade places

Same shape (refl)
period (π)

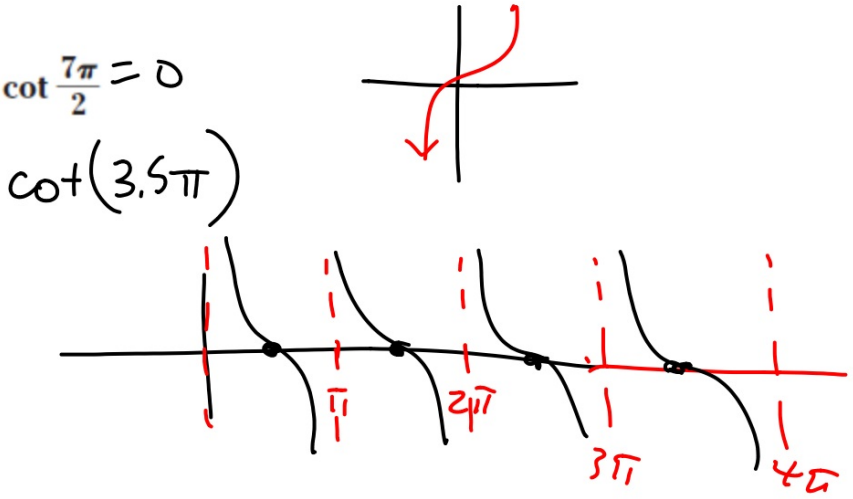
Reciprocals: crossing places & asymptotes

Properties of the Graph of $y = \cot x$

1. The period is π.
2. The domain is the set of real numbers except πn, where n is an integer.
3. The range is the set of real numbers.
4. The x-intercepts are located at $\frac{\pi}{2}n$, where n is an odd integer.
5. There is no y-intercept.
6. The asymptotes are $x = \pi n$, where n is an integer.



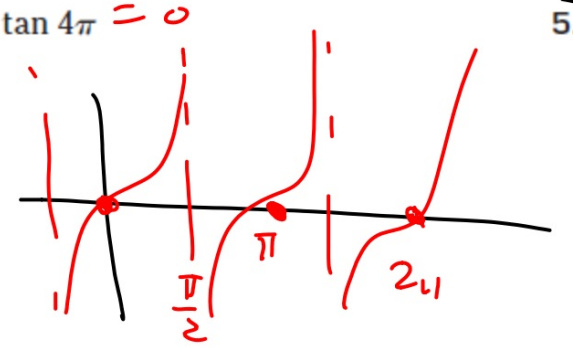
b. $\cot \frac{7\pi}{2} = 0$



tan & cot only (for now)

Find each value by referring to the graphs of the trigonometric functions.

4. $\tan 4\pi = 0$



5. ~~$\csc\left(-\frac{7\pi}{2}\right)$~~

Example 1 Find each value by referring to the graphs of the trigonometric functions.

a. $\tan \frac{9\pi}{2}$

$\tan 4.5\pi = \text{undef}$

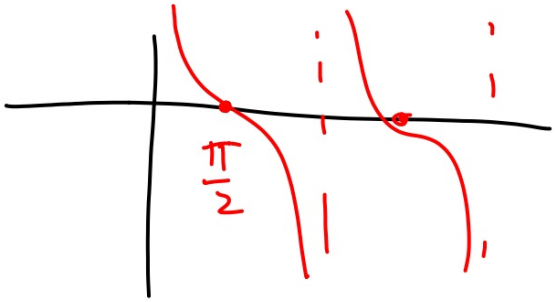
Find each value by referring to the graphs of the trigonometric functions.

13. $\cot\left(\frac{5\pi}{2}\right)$ = 0

14. $\tan(-8\pi)$

15. ~~$\sec\left(\frac{9\pi}{2}\right)$~~

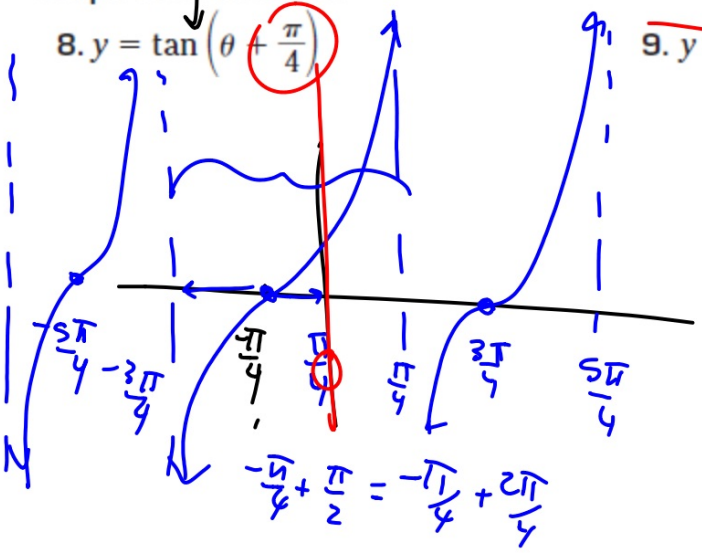
2. 5π



reminder: period for tan & cot is π...all other trig functions have period 2π

Graph each function.

8. $y = \tan\left(\theta + \frac{\pi}{4}\right)$



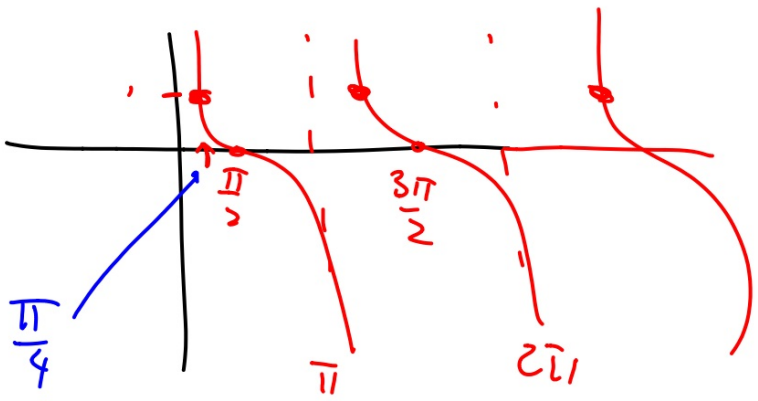
9. $y = \sec(2\theta + \pi) - 1$

Find the values of θ for which each equation is true.

6. $\sec \theta = -1$

7. $\cot \theta = 1$

$\frac{\pi}{4} + \pi n$



Write an equation for the given function given the period, phase shift, and vertical shift.

reminder: default period is π

A = -2 vs +3

left

11. cotangent function period $= 2\pi$, phase shift $= -\frac{\pi}{4}$, vertical shift $= 0$

$y = 3 + 2\cot\frac{1}{2}(\theta + \frac{\pi}{4})$

$\frac{\pi}{n} = \frac{2\pi}{1}$

$\frac{2\pi n}{2\pi} = \frac{\pi}{2\pi} = \frac{1}{2}$

y = sin(x) & y = csc(x)
zeros >>> asymptotes

6.7 13-45

not sec csc