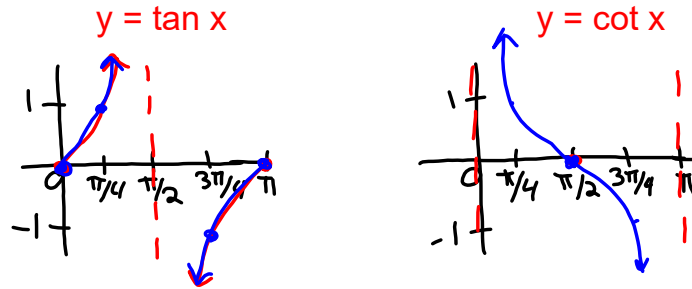


Graphing Tangent & Cotangent

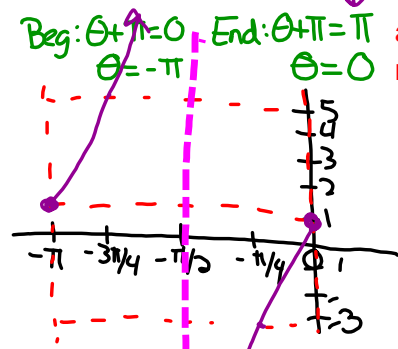
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*** Period = π ***



Graph 1 period. Label 5 points on the x-axis.

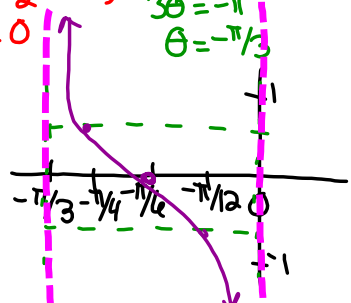
1. $y = 4 \tan(\theta + \pi) + 1$ * for tan+cot!
 $a=4$ $d=1$ $\text{Beg: } \theta + \pi = 0 \Rightarrow \theta = -\pi$ $\text{End: } \theta + \pi = \pi \Rightarrow \theta = 0$
 * Remember tan has an asymptote in the middle & midline points on the outside.



* Remember cot has asymptotes on the outside & a midline point in the middle.

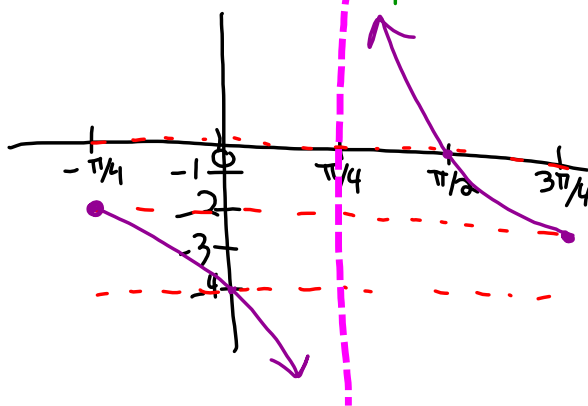
2. $y = 1/2 \cot(3\theta + \pi)$

$a = \frac{1}{2}$ $d = 0$ $\text{Beg: } 3\theta + \pi = 0 \Rightarrow \theta = -\pi/3$ $\text{End: } 3\theta + \pi = \pi \Rightarrow \theta = 0$
 $\frac{1}{2}(-\frac{\pi}{3} + 0) = \frac{1}{2} \cdot \frac{-\pi}{3} = -\frac{\pi}{6}$
 $\frac{1}{2}(-\frac{\pi}{6} + 0) = \frac{1}{2} \cdot \frac{-\pi}{6} = -\frac{\pi}{12}$
 $\frac{1}{2}(-\frac{\pi}{3} + \frac{\pi}{6}) = \frac{1}{2} \cdot \frac{-\pi}{6} = -\frac{\pi}{12}$
 $\frac{1}{2}(\frac{\pi}{6} + 0) = \frac{1}{2} \cdot \frac{\pi}{6} = \frac{\pi}{12}$
 $\frac{1}{2}(\frac{\pi}{3} + 0) = \frac{1}{2} \cdot \frac{\pi}{3} = \frac{\pi}{6}$



3. $y = -2 \tan(\theta + \pi/4) - 2$

$a = -2$ $d = -2$ $\text{Beg: } \theta + \frac{\pi}{4} = 0 \Rightarrow \theta = -\frac{\pi}{4}$ $\text{End: } \theta + \frac{\pi}{4} = \pi \Rightarrow \theta = \frac{3\pi}{4}$
 $\frac{\pi}{1} - \frac{1\pi}{4} = \frac{3\pi}{4}$
 $\frac{4\pi}{4} - \frac{1\pi}{4} = \frac{3\pi}{4}$



$\frac{1}{2}(-\frac{\pi}{4} + \frac{3\pi}{4}) = \frac{1}{2}(\frac{2\pi}{4}) = \frac{2\pi}{8} = \frac{\pi}{4}$