**How to Graph Secant and Cosecant:**
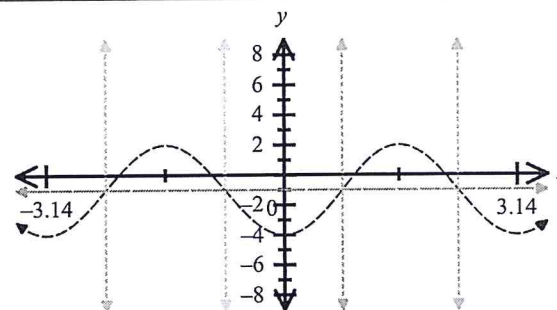
1) Graph the underlying sine or cosine graph. Remember that $\sec x = \dfrac{1}{\cos x}$ and $\csc x = \dfrac{1}{\sin x}$.

2) When the underlying sine/cosine crosses the axis (center line) of its graph, draw a vertical asymptote.

3) Plot a point wherever the underlying sine/cosine reaches the high and low points.

4) Draw parabola-like shapes between each pair of asymptotes and through the high/low points away from the underlying sine/cosine.

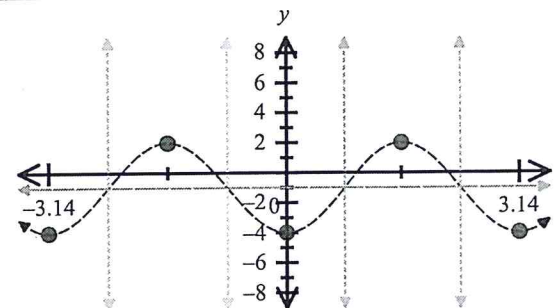Example: Graph $y = 3\sec 2\left(x + \dfrac{\pi}{2}\right) - 1$.
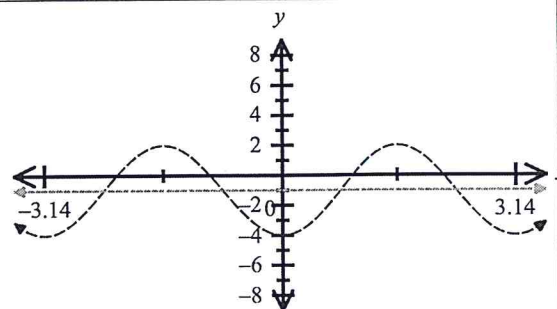
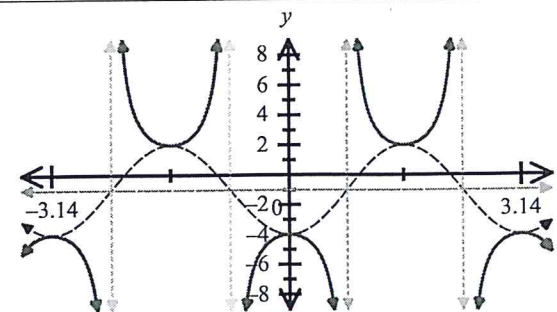|	
1) Graph $y = 3\cos 2\left(x + \dfrac{\pi}{2}\right) - 1$	
2) Draw asymptotes wherever the cosine crosses the center line...	
3) Plot points at high and low points...	
4) Draw the graph...	

How to Graph Tangent and Cotangent: *I will explain why you go through these steps on Monday.*

1) Remember that $\tan x = \dfrac{\sin x}{\cos x}$ and $\cot x = \dfrac{\cos x}{\sin x}$. Find amplitude "a" and axis "k".

2) Graph the axis y ="k".

3) Set the denominator (either sine or cosine) equal to 0 and solve for x. This gives you where the vertical asymptotes are. Plot them.

4) Plot a point on the axis at every midpoint between the asymptotes. These represent "roots" of the tan/cot curve.

5) Find the midpoint between the "roots" and asymptotes. What you do here depends on if it's a tangent or cotangent:
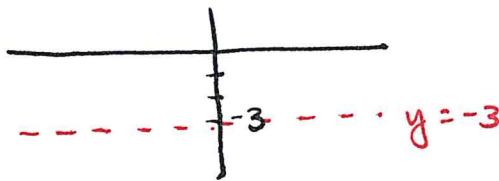
a) Tangent:
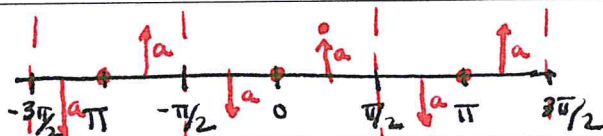
b) Cotangent:
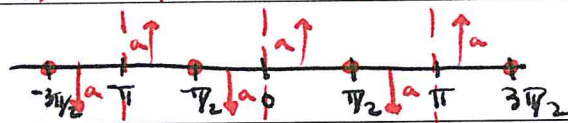
6) Draw the graph.

Example: Graph $y = 2\cot(2x - \pi) - 3$

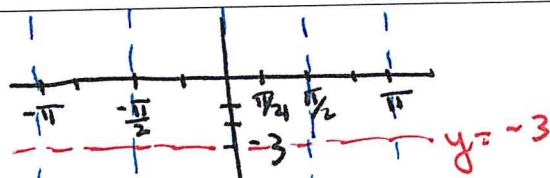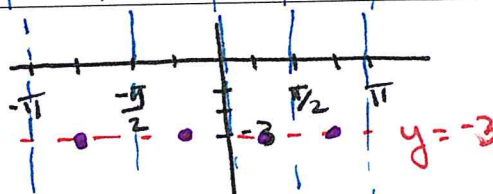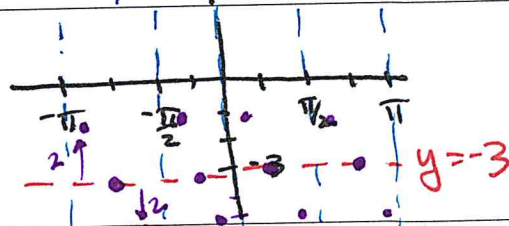| 1 & 2) a = 2 and axis (k) = -3	
3) Set denominator = 0 and solve for asymptotes. Plot them. $\cot = \dfrac{\cos}{\sin}$ $\sin(2x - \pi) = 0$ $2x - \pi = 0, \pi, 2\pi, 3\pi, \ldots$ $2x = \pi, 2\pi, 3\pi, 4\pi, \ldots$ $x = \dfrac{\pi}{2}, \pi, \dfrac{3\pi}{2}, 2\pi, \ldots$	
4) Plot midpoints between asymptotes on axis.	
5) Find midpoints and plot amplitude for cot.	
6) Draw the graph.	