Graphing secant and cosecant functions   Name _____
Practice Worksheet

Example: $y = \sec\left(4x - \dfrac{\pi}{2}\right)$

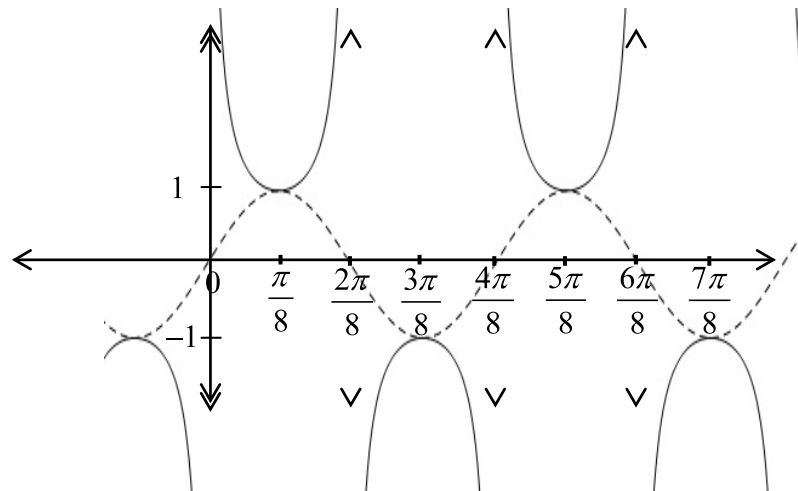$y = \sec 4\left(x - \dfrac{\pi}{8}\right)$

Reciprocal of $y = \cos 4\left(x - \dfrac{\pi}{8}\right)$

Amplitude = 1

period = $\dfrac{2\pi}{4}$ $\rightarrow$ $\dfrac{\pi}{2}$

vertical translation = none

phase shift = $\dfrac{\pi}{8}$ to the right

mark x-axis: $\dfrac{\pi}{2} \div 4 = \dfrac{\pi}{8}$

$\left(\dfrac{\pi}{8};\right)$ $\dfrac{\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{2\pi}{8}\right);$ $\dfrac{2\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{3\pi}{8}\right);$ $\dfrac{3\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{4\pi}{8}\right);$ $\dfrac{4\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{5\pi}{8}\right);$ $\dfrac{5\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{6\pi}{8}\right);$ $\dfrac{6\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{7\pi}{8}\right)$

Draw asymptotes where the cosine curve crosses the centerline. Mark maximum and minimum points on the cosine curve as points that are also on the graph of the secant curve.

Example: $y = 2\csc\left(4x - \dfrac{\pi}{2}\right)$
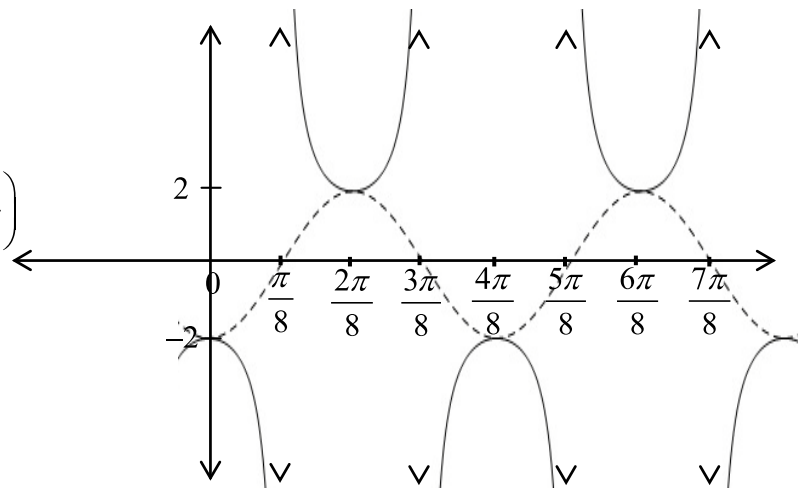
$y = 2\csc 4\left(x - \dfrac{\pi}{8}\right)$

Reciprocal of $y = 2\sin 4\left(x - \dfrac{\pi}{8}\right)$

Amplitude = 2

period = $\dfrac{2\pi}{4}$ $\rightarrow$ $\dfrac{\pi}{2}$

vertical translation = none
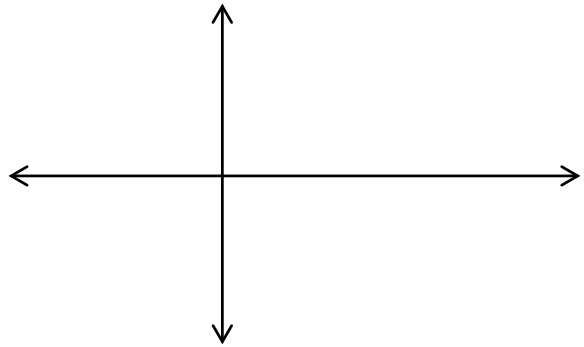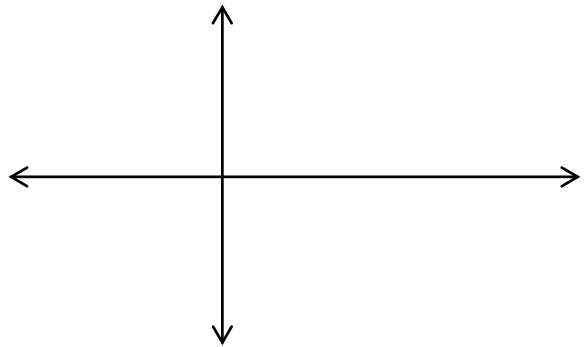
phase shift = $\dfrac{\pi}{8}$ to the right

mark x-axis: $\dfrac{\pi}{2} \div 4 = \dfrac{\pi}{8}$

$\left(\dfrac{\pi}{8};\right)$ $\dfrac{\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{2\pi}{8}\right);$ $\dfrac{2\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{3\pi}{8}\right);$ $\dfrac{3\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{4\pi}{8}\right);$ $\dfrac{4\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{5\pi}{8}\right);$ $\dfrac{5\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{6\pi}{8}\right);$ $\dfrac{6\pi}{8} + \dfrac{\pi}{8} = \left(\dfrac{7\pi}{8}\right)$

Draw asymptotes where the sine curve crosses the centerline. Mark maximum and minimum points on the sine curve as points that are also on the graph of the cosecant curve.

Graph each function over a two-period interval. Practice accuracy and label all axes completely!
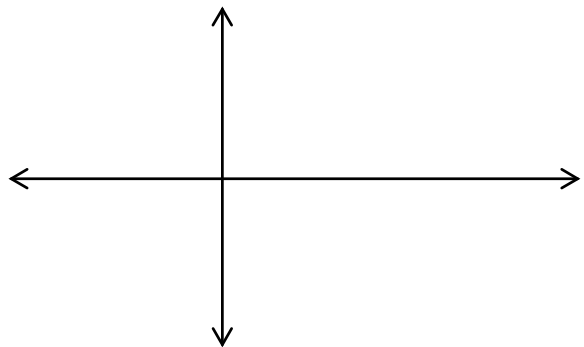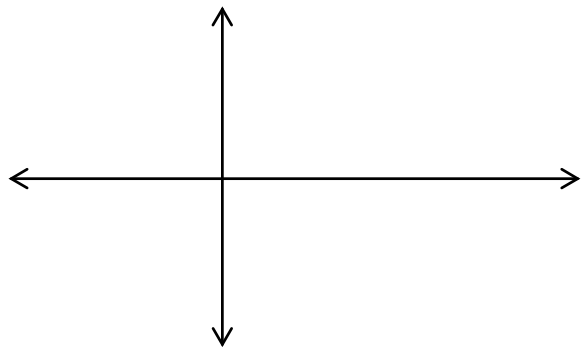
1. $y = \sec \dfrac{x}{2}$
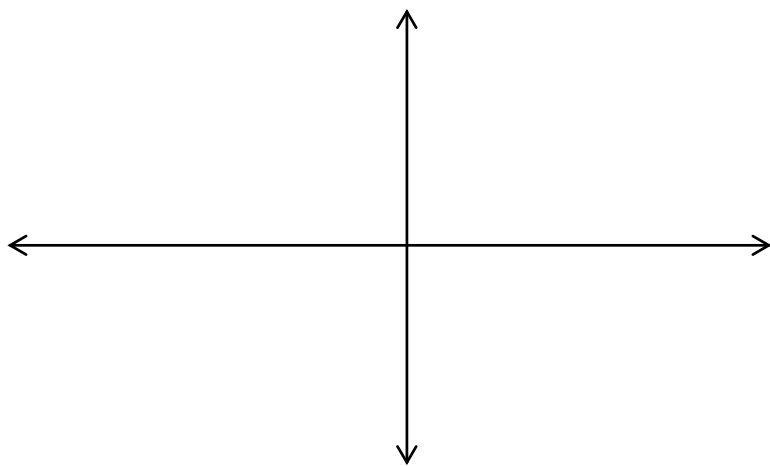
2. $y = -\sec\left(\dfrac{\pi x}{4}\right)$

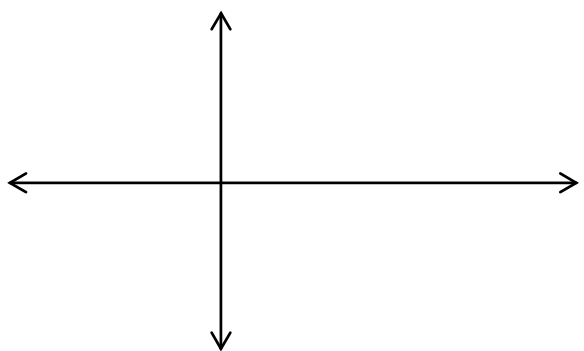3. $y = \sec\left(x + \dfrac{\pi}{4}\right)$

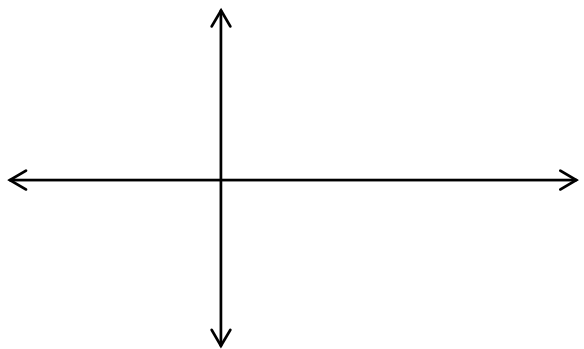4. $y = -2\sec\left(\dfrac{\pi x}{4} - \dfrac{\pi}{2}\right)$
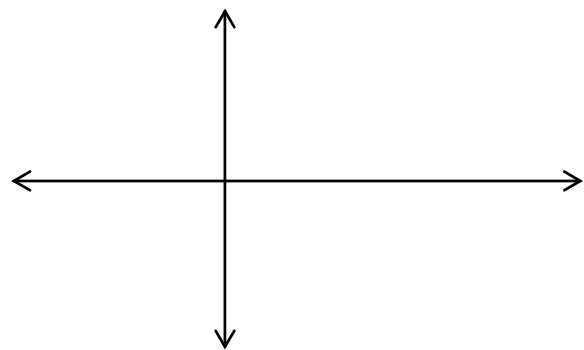
5. $y = 1 + 2\sec x$
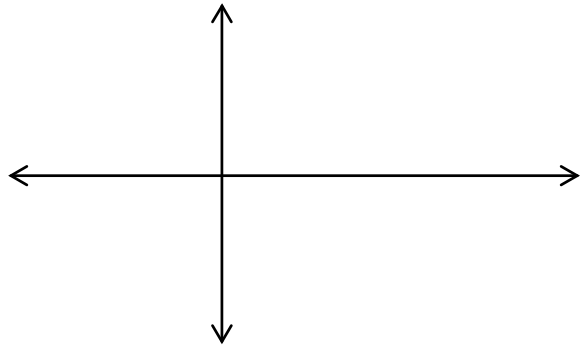
6. $y = -\csc\left(\dfrac{x}{2}\right)$

7. $y = 2\csc\dfrac{\pi x}{4}$

8. $y = \csc\left(2x - \dfrac{\pi}{2}\right)$

9. $y = -\csc\left(\dfrac{\pi x}{2} - \dfrac{\pi}{4}\right)$

10. $y = 3 + 2\csc x$