

Find the vertical asymptotes of the following functions:

1) $y = \csc\left(3x + \frac{\pi}{6}\right) + 3$

VA: $3x + \frac{\pi}{6} = 0$
 $x = -\frac{\pi}{18}$

2) $y = \sec x + 3$

VA: $x = \pm \frac{\pi}{2}$

3) $y = \sec\left(x - \frac{\pi}{2}\right) + 4$

$x - \frac{\pi}{2} = \frac{\pi}{2}$ $x - \frac{\pi}{2} = -\frac{\pi}{2}$

VA: $x = \pi, 0$

4) $f(x) = \csc \frac{x}{3} - 2$

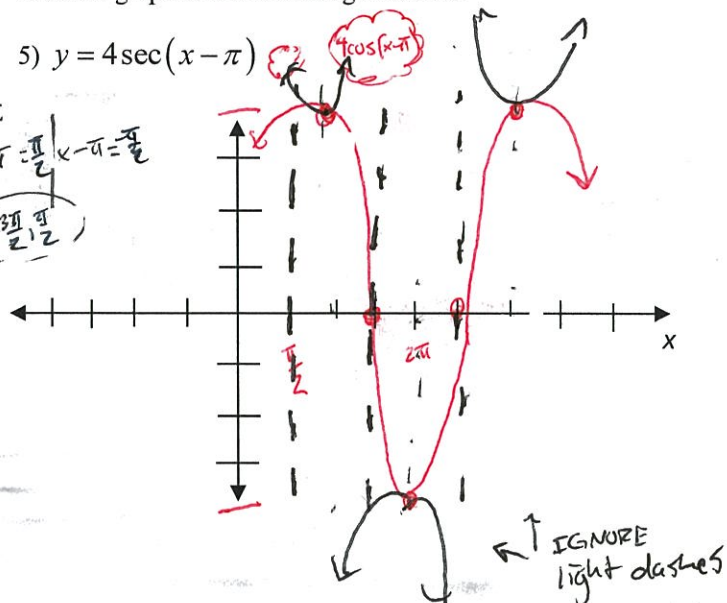
$\frac{x}{3} = 0$ $\frac{x}{3} = \pi$

VA: $x = 0, 3\pi$

Sketch a graph of the following functions:

5) $y = 4 \sec(x - \pi)$

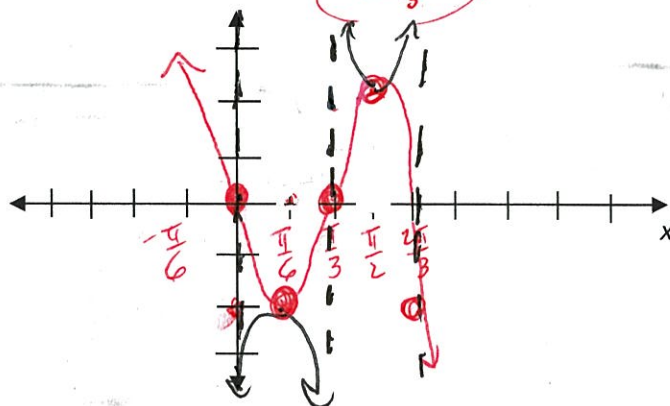
VA: $x - \pi = \frac{\pi}{2}$ $x - \pi = -\frac{\pi}{2}$
 $x = \frac{3\pi}{2}, \frac{\pi}{2}$



6) $y = -2 \csc 3x$

VA: $3x = \pi$ $3x = 0$

$x = \frac{\pi}{3}, 0$



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1) $y = \csc\left(3x + \frac{\pi}{6}\right) + 3$

2) $y = \sec x + 3$

3) $y = \sec\left(x - \frac{\pi}{2}\right) + 4$

4) $f(x) = \csc \frac{x}{3} - 2$

Sketch a graph of the following functions:

5) $y = 4 \sec(x - \pi)$

6) $y = -2 \csc 3x$

