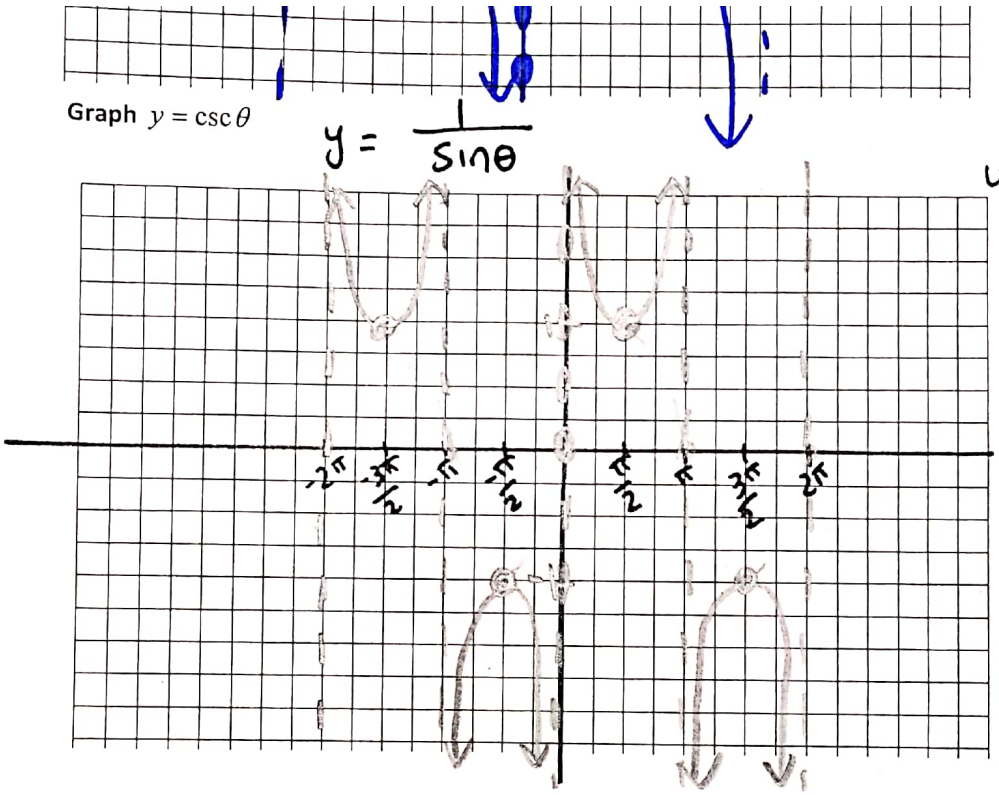
Graph $y = \csc\theta$



3π | undef

use pencil to draw sinθ

sinθ → cscθ

intersect → V.A.

incr → decr

decr → incr

1 → 1

-1 → -1

erase sinθ

Properties of the graph of $y = \csc\theta$.

1. The period is 2π.
2. The domain is the set of real numbers except πn, where n is an integer.
3. The range is $(-\infty,-1]\cup[1,\infty)$.
4. There is no x intercept.
5. There is no y intercept.
6. The vertical asymptotes are $x = \pi n$, where n is an integer.
7. y = 1 when $x = \frac{\pi}{2} + 2\pi n$, where n is an integer.
8. y = -1 when $x = \frac{3\pi}{2} + 2\pi n$, where n is an integer.

5. The y intercept is (0, 0).

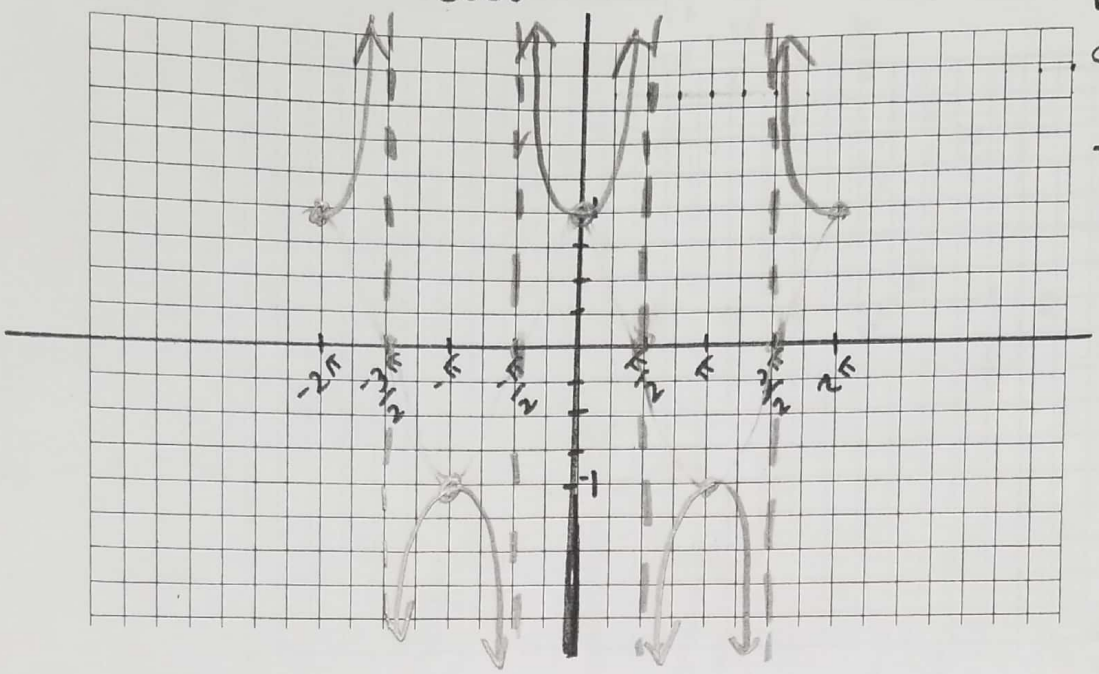
6. The vertical asymptotes are $x = \frac{\pi}{2}n$, where n is an odd integer.

Graph $y = \sec\theta$.

$y = \frac{1}{\cos\theta}$

use pencil to draw $\cos\theta$

For reciprocal: $\cos\theta \rightarrow \sec$.
intersect → V.A
incr → decr
decr → incr
1 → 1
-1 → -1
erase $\cos\theta$



Properties of the graph of $y = \sec\theta$.

1. The period is 2π.
2. The domain is the set of real numbers except $\frac{\pi}{2}n$, where n is an odd integer.
3. The range is $(-\infty,-1]\cup[1,\infty)$.
4. There is no x intercept.
5. The y intercept is (0,1).
6. The vertical asymptotes are $x = \frac{\pi}{2}n$, where n is an odd integer.
7. y = 1 when $x = \pi n$, where n is an even integer.
8. y = -1 when $x = \pi n$, where n is an odd integer.

4 Sketch the graph of $y = 2\csc\left(x + \frac{\pi}{4}\right)$ for 2 cycles of output values.

$\csc x \rightarrow \frac{1}{\sin x}$

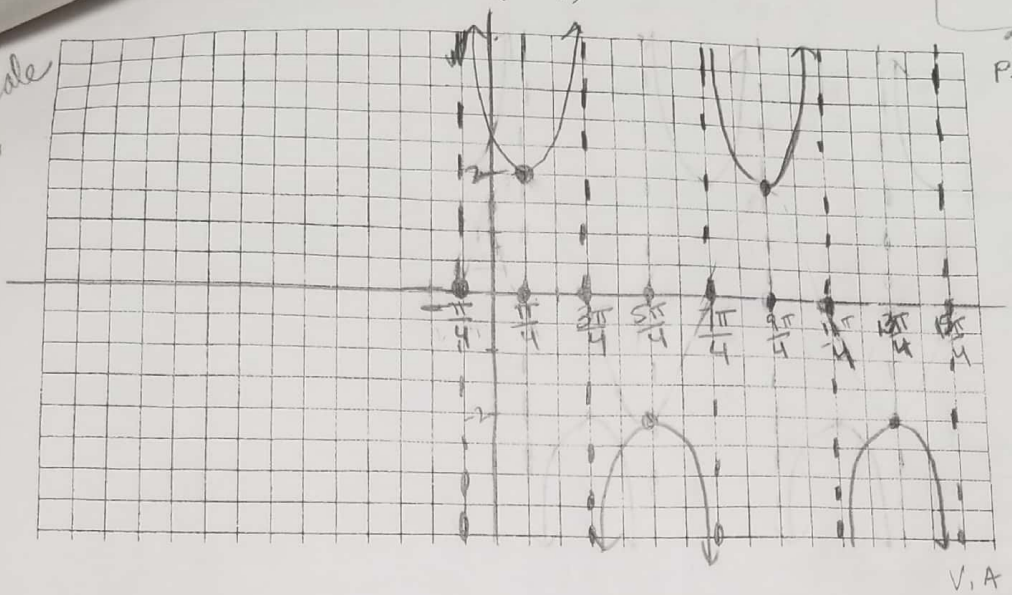
left endpt $x + \frac{\pi}{4} = 0$ → $x = -\frac{\pi}{4}$ ↑ P.S.

Rt endpt $x + \frac{\pi}{4} = 2\pi - \frac{\pi}{4}$ → $x = \frac{7\pi}{4}$

$\frac{\pi}{2}$ scale

$-\frac{\pi}{4} + \frac{2\pi}{4} = \frac{\pi}{4}$

$\frac{3\pi}{4} + \frac{2\pi}{4}$ By



amp of sine = 2

period = 2π

$-\frac{\pi}{4} + \frac{7\pi}{4} = \frac{6\pi}{4} = \frac{3\pi}{2} \cdot \frac{1}{2}$

$\frac{7\pi}{4} + \frac{2\pi}{4}$

$\frac{9\pi}{4} + \frac{2\pi}{4}$

$\frac{13\pi}{4} + \frac{2}{}$

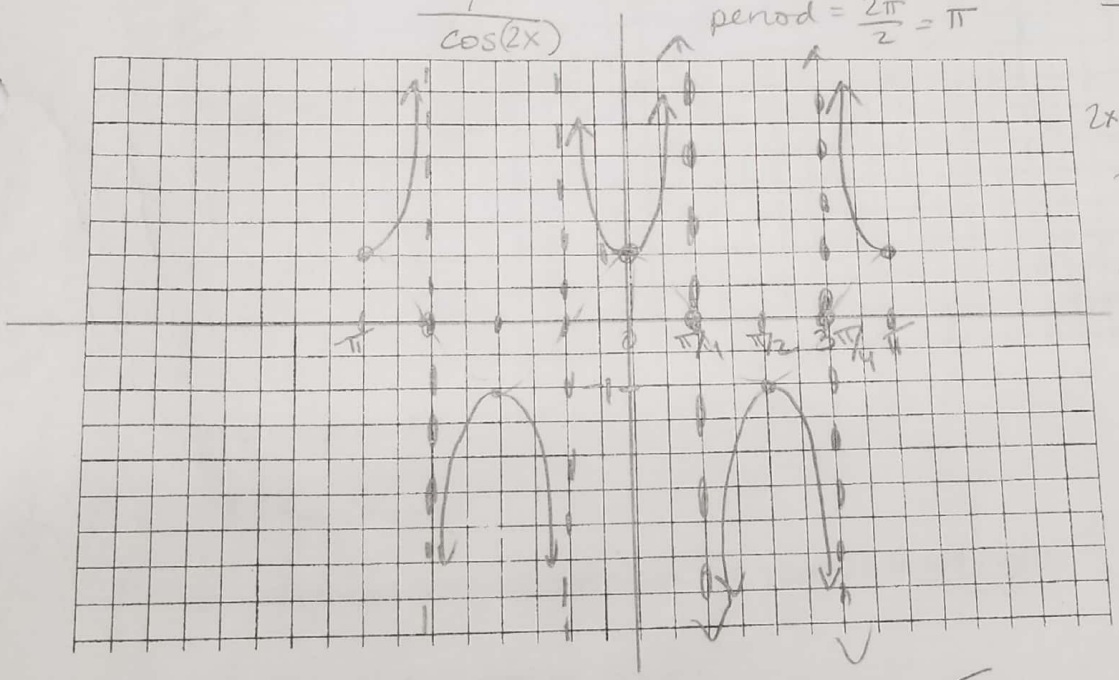
$\frac{7\pi}{4} + \frac{8\pi}{4} = \frac{15\pi}{4}$

V.A. $x = -\pi/4, 3\pi/4, 7\pi/4$

points $(\frac{\pi}{4}, 2)(\frac{5\pi}{4}, -2)$

Ex: 5 Sketch the graph of $y = \sec(2x)$ for 2 cycles of output values.

$\frac{1}{\cos(2x)}$ period $= \frac{2\pi}{2} = \pi$



$2x = 0$ $2x = 2\pi$

$x = 0$ $x = \pi$

↑ left endpt ↑ right endpt

graph cosine

One cycle

V.A. $x = \pi/4, 3\pi/4$

Critical pts $(0,1)\ (\frac{\pi}{2}, -1)\ (\pi, 1)$