Warm-up

March 20, 2017

Graph and find equation of asymptote.

$y = -5\cot\left(2x + \frac{\pi}{3}\right) - 4$

$a = -5 \quad b = 2 \quad C = -\frac{\pi}{3} \quad d = -4$

amplitude: 5

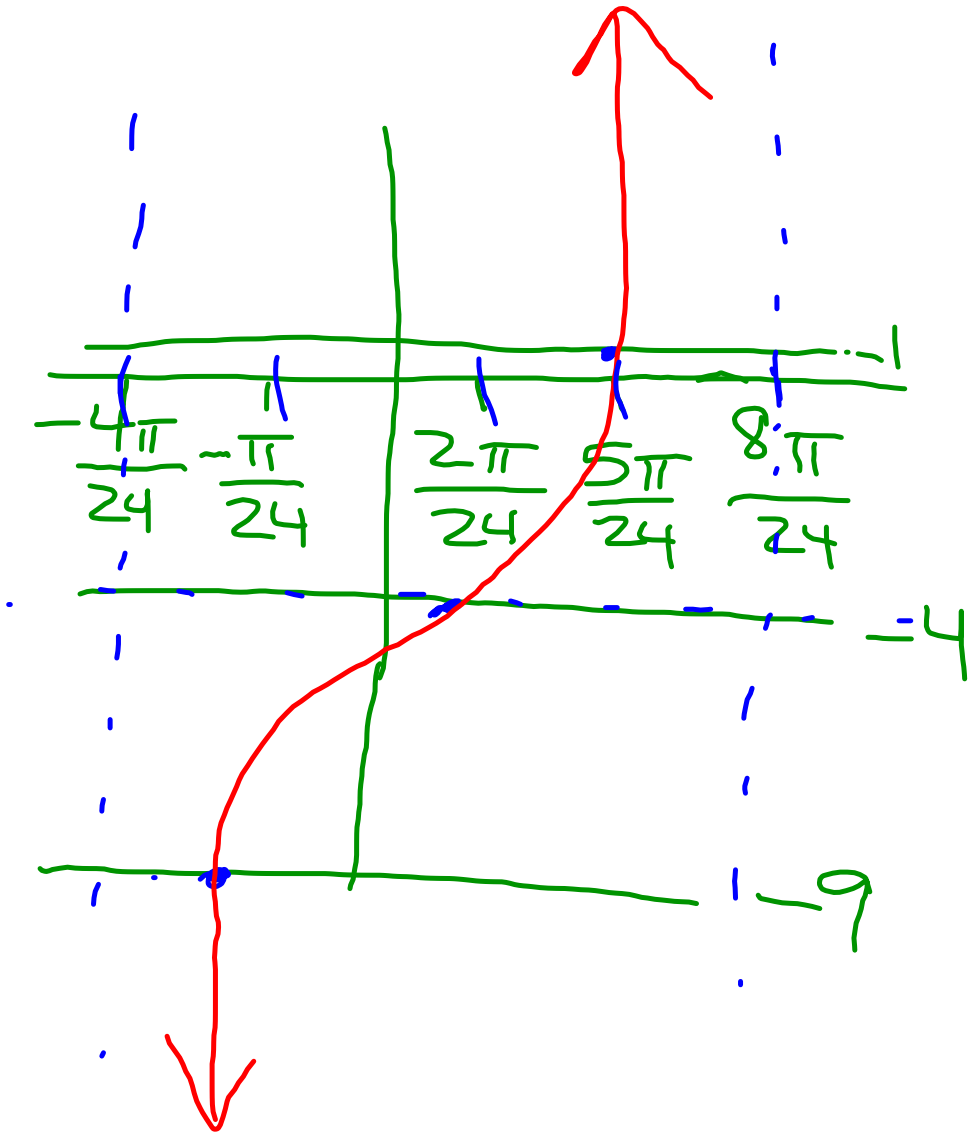
period: $\frac{\pi}{2}$

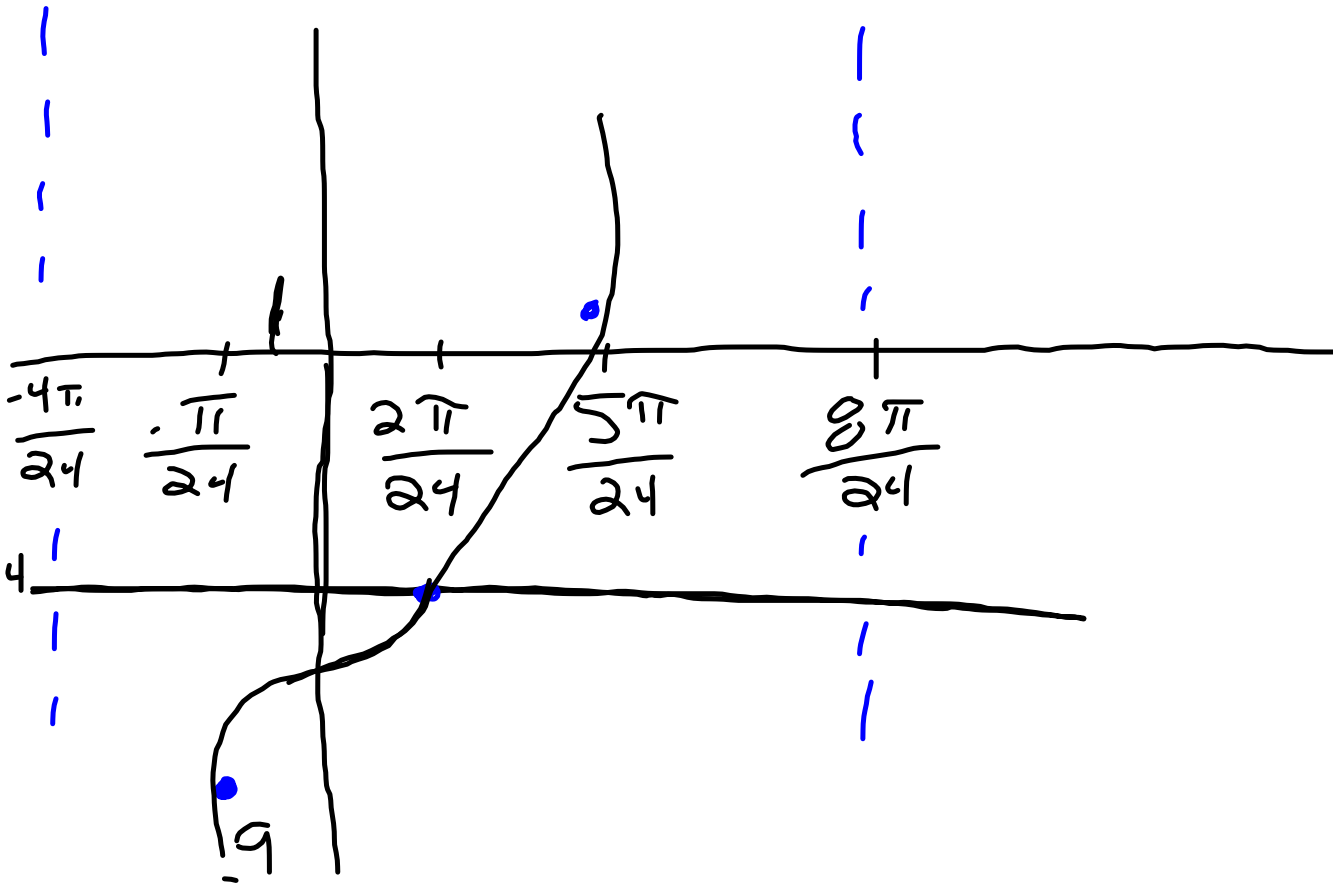
$\text{Interval} = \frac{\text{Per}}{4} = \frac{\frac{\pi}{2}}{4} = \frac{\pi}{8}$

PS $-\frac{\pi}{3} \cdot \frac{1}{2} = -\frac{\pi}{6}$ VS $= -4$

$\frac{\pi}{8} \cdot 3$ $\quad -\frac{\pi}{6} \cdot 4$

$\frac{3\pi}{24}$ $\quad \frac{-4\pi}{24}$


-1
$-\frac{4\pi}{24}$
$-\frac{\pi}{24}$
$\frac{2\pi}{24}$
$\frac{5\pi}{24}$
$\frac{8\pi}{24}$
-4
-9


-4π/24
π/24
2π/24
5π/24
8π/24
4
-9

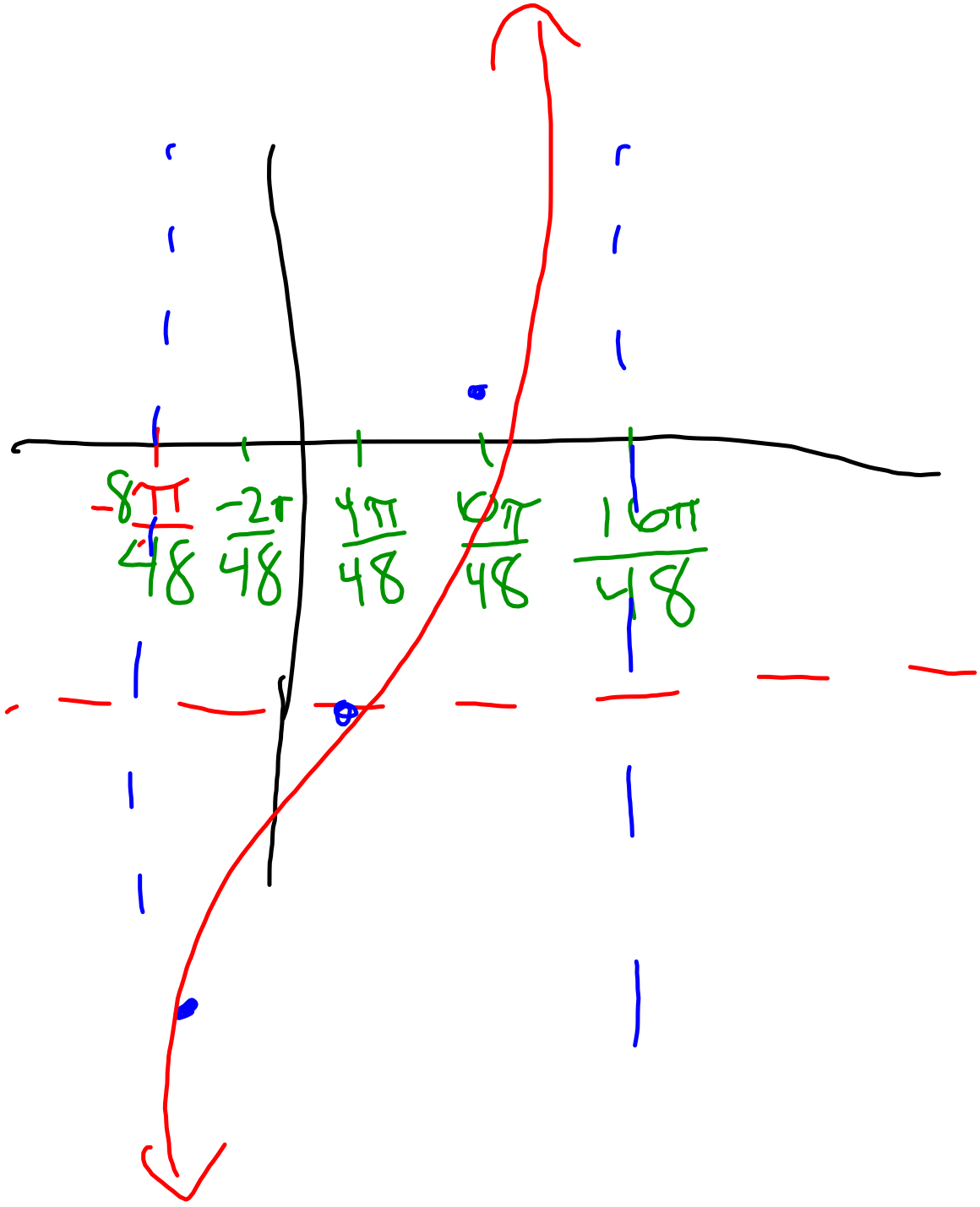
$a = -5 \quad b = 2 \quad c = -\frac{\pi}{3} \quad d = 4$

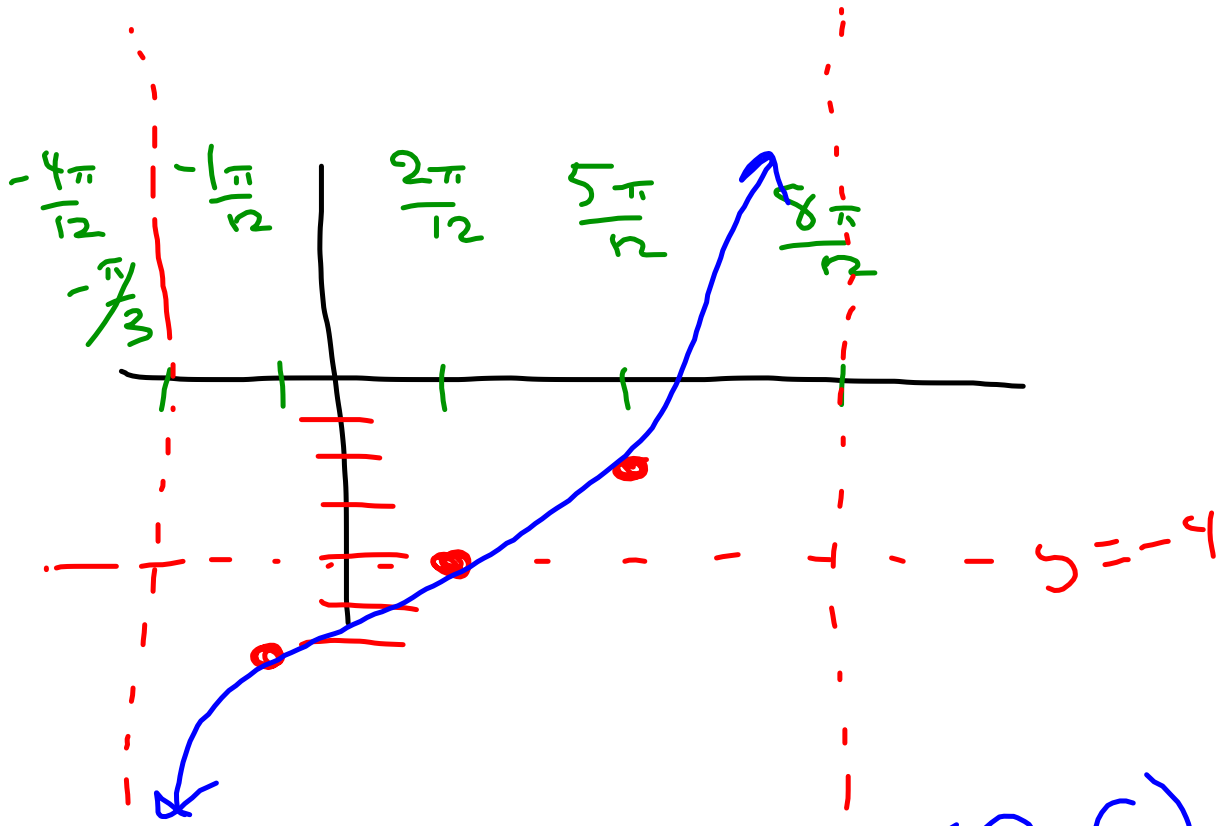
$amp = 5 \quad per = \frac{\pi}{2}$

$int = \frac{\frac{\pi}{2}}{4} = \frac{\pi}{8} \cdot \frac{6}{6} = \frac{6\pi}{48}$

$PS = \frac{c}{b} = \frac{-\frac{\pi}{3}}{2} = -\frac{\pi}{6} \cdot \frac{8}{8} = \frac{-8\pi}{48}$

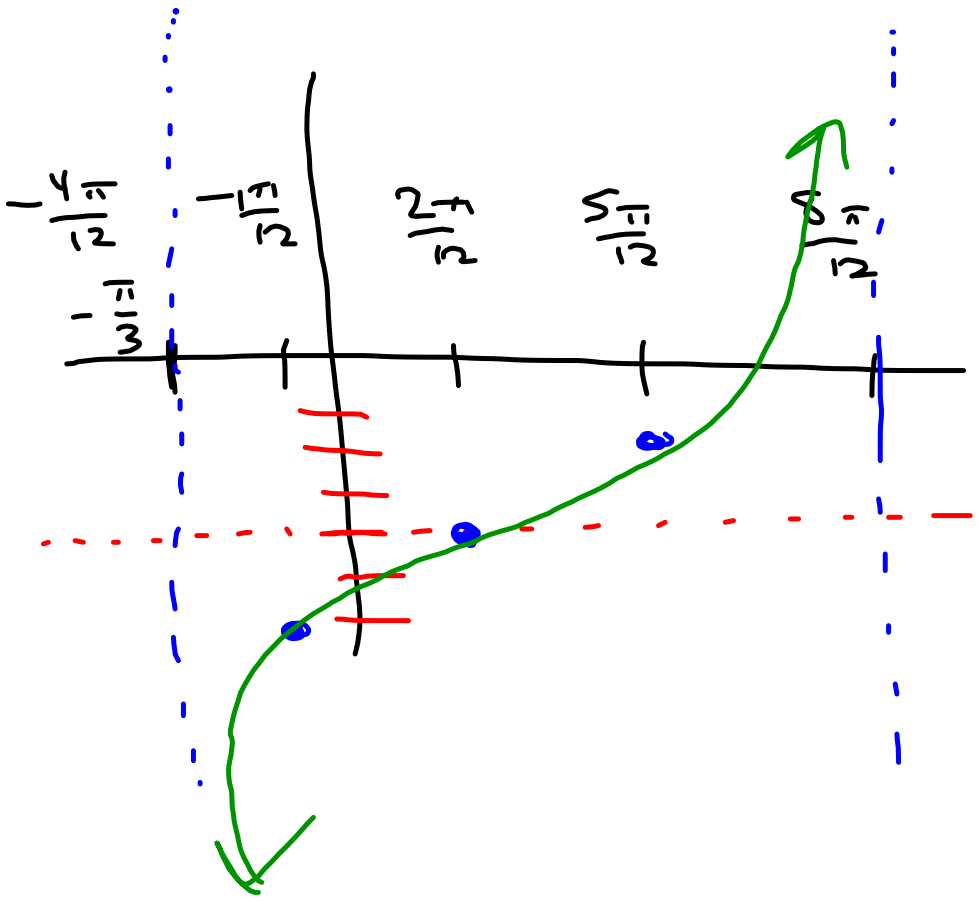
$VS = -4$


$-\frac{8\pi}{48}$
$-\frac{2\pi}{48}$
$\frac{4\pi}{48}$
$\frac{10\pi}{48}$
$\frac{16\pi}{48}$



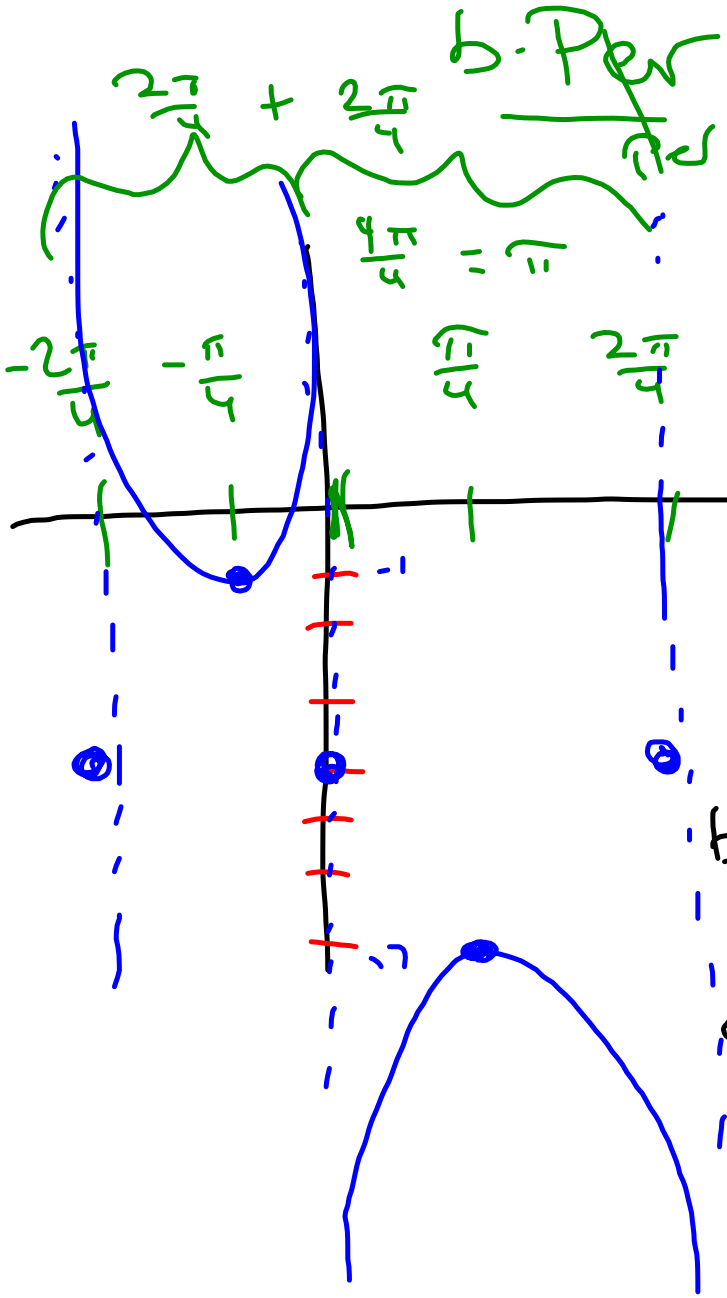
$x = (\text{first}) + n(\text{per})$

$x = -\frac{\pi}{3} + n(\pi)$



$x = (\text{first}) + n(\text{per})$

$x = -\frac{\pi}{3} + n(\pi)$



$b \cdot Per = \frac{2\pi}{b} \cdot b$

$\frac{b \cdot Per}{Per} = \frac{2\pi}{b} \cdot \frac{b}{Per}$

$b = \frac{2\pi}{Per}$

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

$b = 2$

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

$\frac{4\pi}{4} = \pi$

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

$b \cdot PS = \frac{c}{b} \cdot b$

$c = b \cdot (Phase\ Shift)$

$2\left(-\frac{2\pi}{4}\right)$

$-\frac{4\pi}{4}$

$c = -\pi$

$y = a + \cancel{\text{trig}}(bx - c) + d$

$y = 3\csc(2x + \pi) - 4$

$\frac{\text{max} + \text{min}}{2} = d$

$\frac{-1 + -7}{2} = \frac{-8}{2} = -4 = d$

midline $= d$

max d

$-1 \quad -4$

$a_{rp} = |\text{max} - d|$

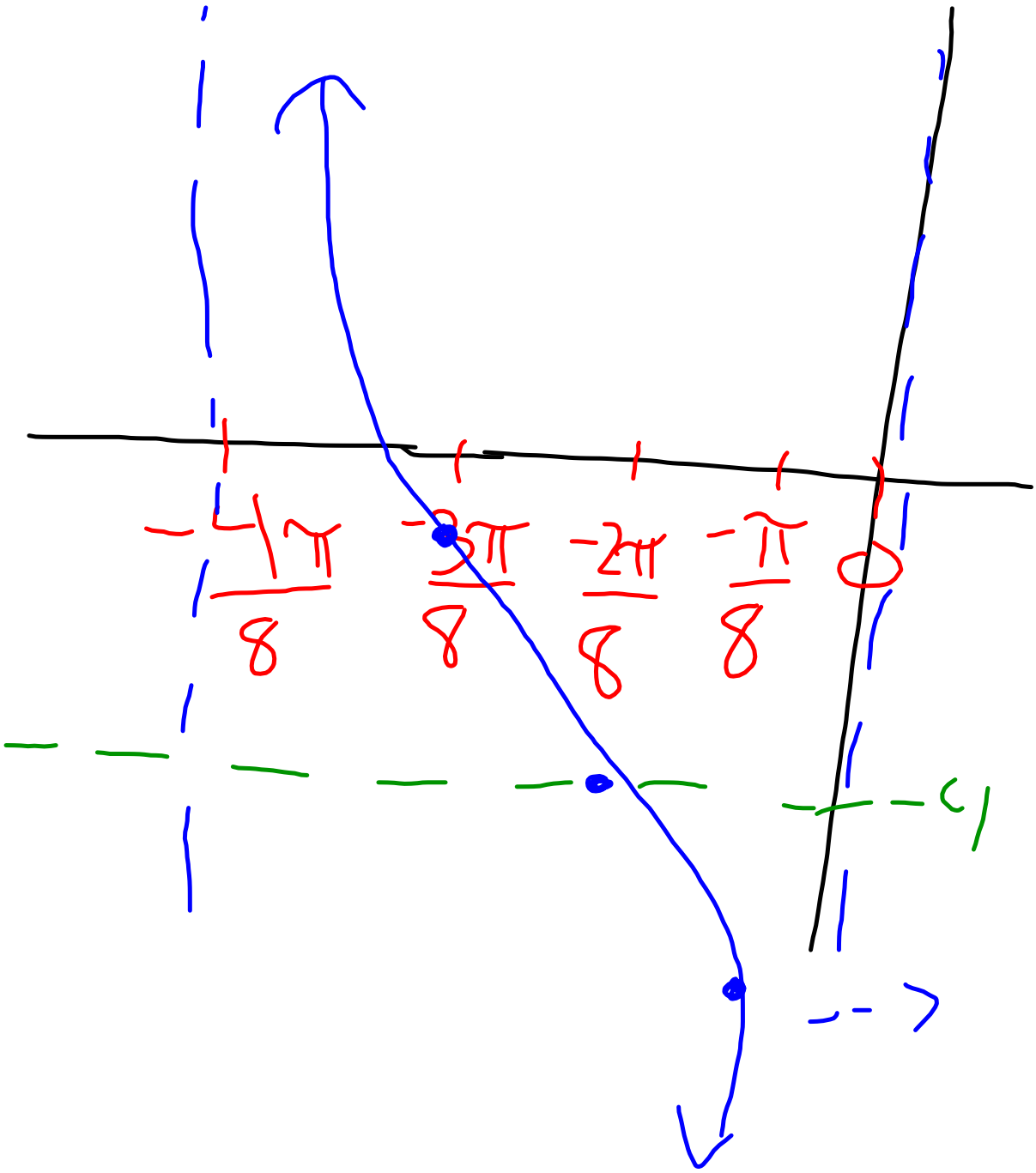
$\frac{\text{max} - \text{min}}{2} = \text{amp} \rightarrow a$

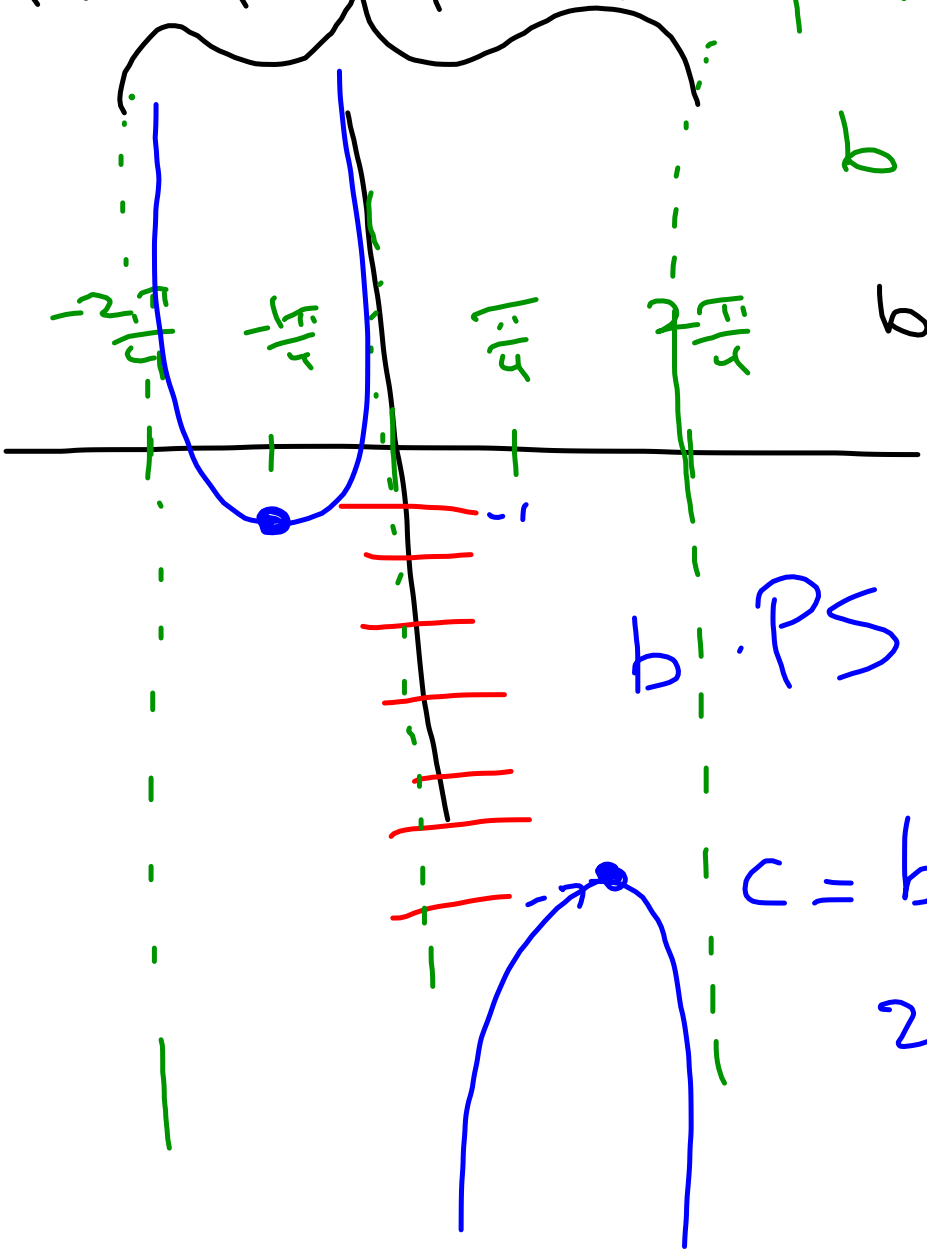
$\frac{-1 - (-7)}{2} = \frac{6}{2} = 3$


Cris is good!

Graph:

$y = 3\cot(2x + \pi) - 4$


-4π/8
-3π/8
-2π/8
-π/8
0
1



$Per = \frac{2\pi}{b}$

$b = \frac{2\pi}{Per}$

$b = \frac{2\pi}{\pi} = 2$

$b \cdot PS = \frac{c}{b} \cdot \frac{b}{1}$

$c = b(\text{Phase Shift})$

$2\left(\frac{-2\pi}{4}\right)$

$\frac{-4\pi}{4}$

$c = -\pi$

$y = a\sin(bx - c) + d$

$3 \quad \csc \quad (2x + \pi) \quad -4$

max + min / 2 = d midline

$\frac{-1 + -7}{2} = \frac{-8}{2} = -4$

$-1 - -4 = 3$

- max − d = amp → a
- $\frac{\text{max} - \text{min}}{2} = \text{amp} \rightarrow a$

$\frac{-1 - (-7)}{2}$

$\frac{6}{2} = 3$

$y = -4$

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

Per $= 2\pi$ b

$\frac{4\pi}{4}$

π

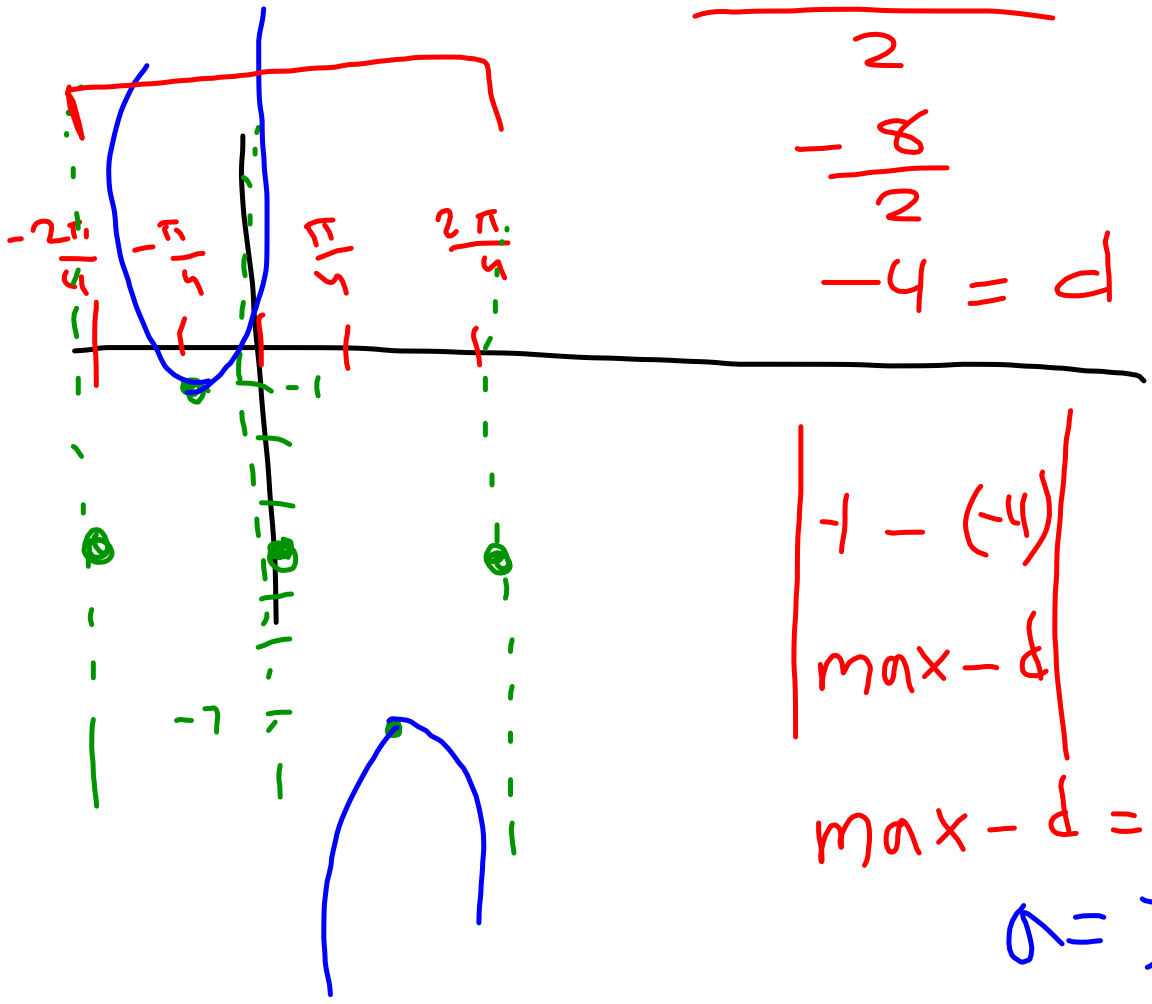
$b = \frac{2\pi}{Per} = \frac{2\pi}{\pi} = 2$

$\frac{max + min}{2}$

$\frac{1 + -7}{2}$

$\frac{-8}{2}$

$-4 = d$



$|-1 - (-4)|$

$|max - d|$

$max - d = a$

$a = 3$

$\frac{1}{\sin}$

$3\csc(2x+\pi)-4$

$PS = \frac{c}{b}$

$2 \cdot \frac{2\pi}{4} = \frac{c}{2}$

$c = -\frac{4\pi}{4} = -\pi$

$$d = \frac{max + min}{2} = VS = midline$$

$$a = max - d$$

OR

$$a = \frac{max - min}{2} = amp$$

sin, cos, sec, csc

$$b = \frac{2\pi}{per}$$

tan, cot

$$b = \frac{\pi}{per}$$

$$c = b \cdot (Phase\ Shift)$$

2) period 2π b 1

maximum $-1/2$ minimum $-3/2$

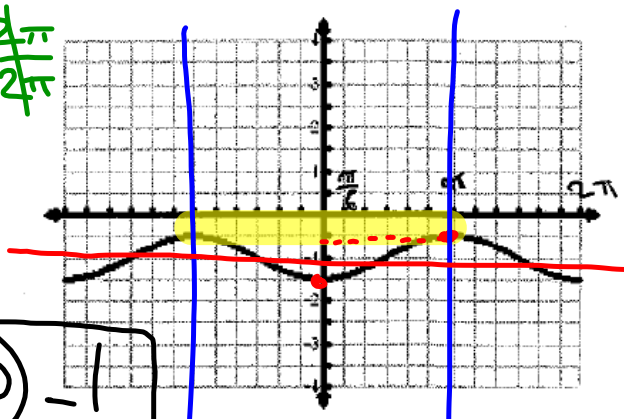
amplitude $\frac{1}{2}$ vertical slide -1

phase shift (cosine) 0 $= c$

cosine equation

$$y = -\frac{1}{2}\cos(1x - 0) - 1$$

$b = \frac{2\pi}{\text{pd}} = \frac{2\pi}{2\pi}$



$12\left(\frac{\pi}{6}\right)$

$\text{amp} = \frac{\text{max} - \text{min}}{2}$

$= \frac{\left(\left(-\frac{1}{2}\right) - \left(-\frac{3}{2}\right)\right)}{2} = \frac{1}{2}$

$d = \frac{\left(\left(-\frac{1}{2}\right) + \left(-\frac{3}{2}\right)\right)}{2} = -1$

1) period 360° b $\frac{360}{per} = \frac{360}{360} = 1$

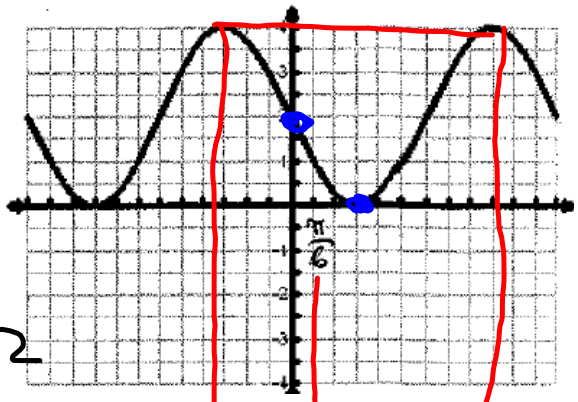
maximum 4 minimum 0

amplitude 2 vertical slide 2

$a = 2$

phase shift (sine) No PS $0 = c$

sine equation $y = -2\sin(1x - 0) + 2$



$y = -2\sin x + 2$

12 (30°)

360°

$\frac{max - min}{2}$

$\frac{4 - 0}{2} = 2$

$\frac{max + min}{2} = \frac{4 + 0}{2} = 2$

$\sin(x) \rightarrow \cos(x-90^\circ)$

$\csc(x) \rightarrow \sec(x-90^\circ)$

$\cos(x) \rightarrow \sin(x+90^\circ)$

$\sec(x) \rightarrow \csc(x+90^\circ)$

a, d, and b are the same!

period 2π b 1

maximum $-\frac{3}{2}$ minimum $-\frac{5}{2}$

amplitude $\frac{1}{2}$ vertical slide -2

phase shift (cosine) $-\frac{\pi}{2}$

cosine equation $y=\frac{1}{2}\cos(1x+\frac{\pi}{2})-2$