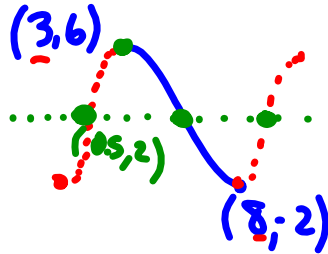


Determine the zeros of a sinusoidal function that has consecutive maximum and minimum of  $(3, 6)$  and  $(8, -2)$ , consecutively.



$$A = \frac{6 - (-2)}{2} = \frac{8}{2} = 4 \quad \therefore a = \pm 4$$

$$\frac{1}{2}P = 8 - 3 = 5 \quad \therefore b = \pm \frac{2\pi}{10} = \pm \frac{\pi}{5}$$

$$\therefore P = 10$$

$$k = 6 - 4 = 2$$

$$h = 3 \quad a^+ \cos$$

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

$$0 = 4 \cos\left(\frac{\pi}{5}(x-3)\right) + 2$$

$$-\frac{1}{2} = \cos\left(\frac{\pi}{5}(x-3)\right)$$

$$\left\{6.\bar{3} + 10n, 9.\bar{6} + 10n\right\}, n \in \mathbb{Z}$$

$$\textcircled{1} \quad \frac{2\pi}{3} = \frac{\pi}{5}(x-3)$$

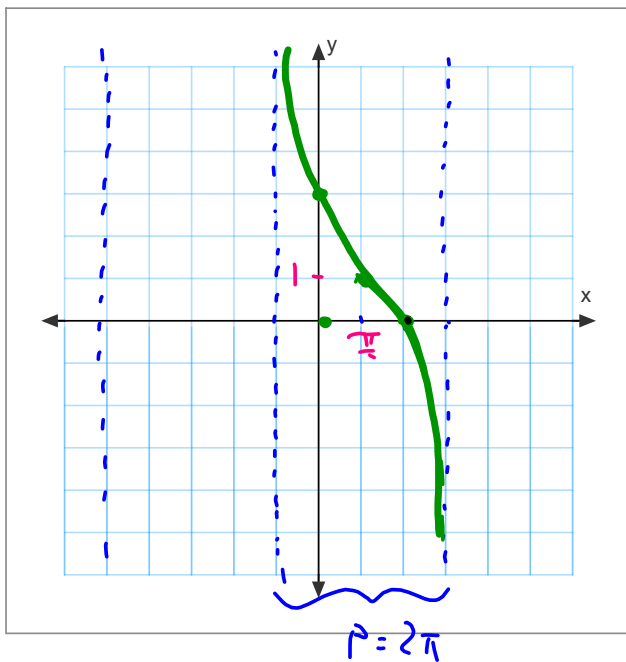
$$\textcircled{2} \quad \frac{4\pi}{3} = \frac{\pi}{5}(x-3)$$

$$\frac{10}{3} = x-3$$

$$6.\bar{3} = x$$

$$\frac{20}{3} = x-3$$

$$9.\bar{6} = x$$



$$f(x) = -2 \tan \frac{1}{2} \left( x - \frac{\pi}{2} \right) + 1$$

a<sup>-</sup> b<sup>+</sup> dec ↘

$$b = \frac{1}{2} \quad P = \frac{\pi}{b} = \pi \cdot 2 \quad (2\pi)$$

asymptote:

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

$$h \pm \frac{P}{2} \quad x - \frac{\pi}{2} = \pi$$

$$x = \frac{3\pi}{2}$$

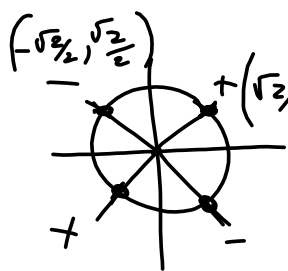
(h, k)

$\left( \frac{\pi}{2}, 1 \right)$

$$\frac{\pi}{2} \pm \frac{2\pi}{2}$$

$$\frac{\pi}{2} \pm \pi$$

$$\frac{3\pi}{2}, -\frac{\pi}{2}$$

#8 let  $y = 0$ 

$$\frac{\sin \theta}{\cos \theta} = \tan \theta$$

$$P = \pi \div \pi/4 = 4$$

$$h \mp \frac{P}{2} = 1 \pm 2$$

$$\Rightarrow \{-1, 3\}$$

$$0 = 4 + \tan \pi/4(x-1) + 4$$

$$-4 = 4 \tan \pi/4(x-1)$$

$$-1 = \tan \pi/4(x-1)$$

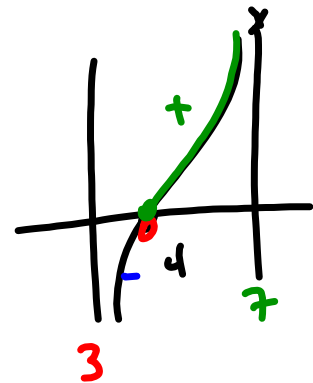
$$\tan^{-1}(-1) = \pi/4(x-1)$$

$$3\pi/4 = \pi/4(x-1)$$

$$3 = x-1$$

$$\underline{\underline{4 = x}}$$

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$$[4, 7[$$

$$[4+4n, 7+4n[,$$

$$n \in \mathbb{Z}$$

9 Variation :  $a^+ b^+$

Decreasing  
 ~~$\mathbb{R} \{-1+6n\}_{n \in \mathbb{Z}}$~~  Dom: ?

asymptotes:  $h \pm p/2$

$$p = \pi \div \pi/6 = 6$$

$$-4 \pm 3$$

$$\{-7, -1\}$$

Determine the variation of  $y = 2 \tan 4(x - \frac{\pi}{2}) - 8$   
 $a+b^+$  increasing over its entire domain

Increasing:  $\mathbb{R} \setminus \{ \frac{5\pi}{8} + \frac{\pi}{4}n \}, n \in \mathbb{Z}$

$$\textcircled{1} 4(x - \frac{\pi}{2}) = \frac{\pi}{2} \quad \text{or} \quad \textcircled{2}$$

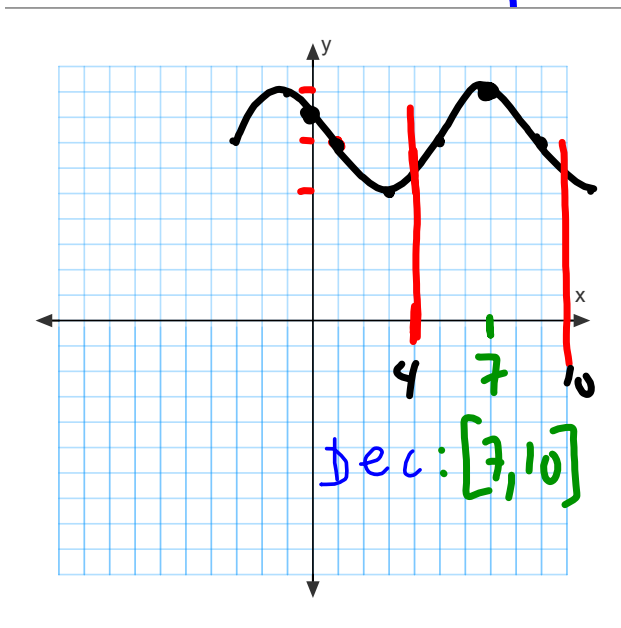
$$h \pm p/2 = x \quad p = \frac{\pi}{4}$$

$$\frac{\pi}{2} \pm \frac{\pi}{8} = x$$

$$\frac{4\pi}{8} \pm \frac{\pi}{8} = x$$

$$x = \frac{5\pi}{8} \text{ one asymptote}$$

Determine where, the function  
 $f(x) = -2 \sin\left(\frac{\pi}{4}(x-1)\right) + 7$   
 is decreasing over the interval  $x \in [4, 10]$



$$A = 2 \quad \text{max} = 9$$

$$k = 7 \quad \text{min} = 5$$

$$P = \frac{2\pi}{\frac{\pi}{4}} = 2\pi \cdot \frac{4}{\pi} = 8$$

$$\frac{8}{4} = 2$$

