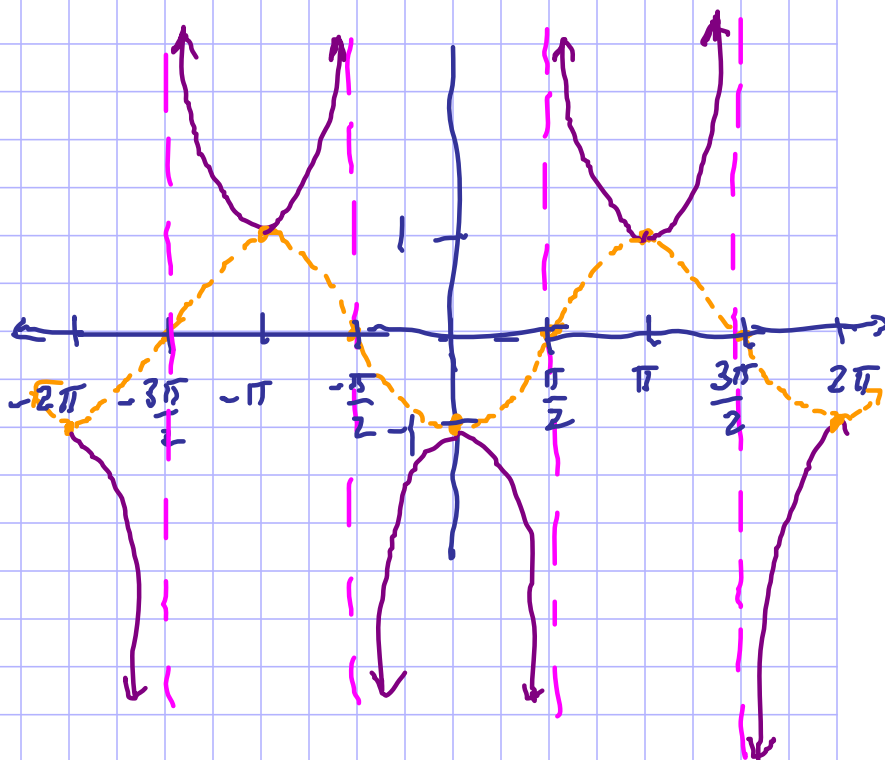


11.2a # 17-20, 23-25, 27-30

$$17. g(x) = -\sec x = \frac{1}{-\cos x}$$

$$\text{Per} = \frac{2\pi}{|b|} = \frac{2\pi}{|1|} = 2\pi$$

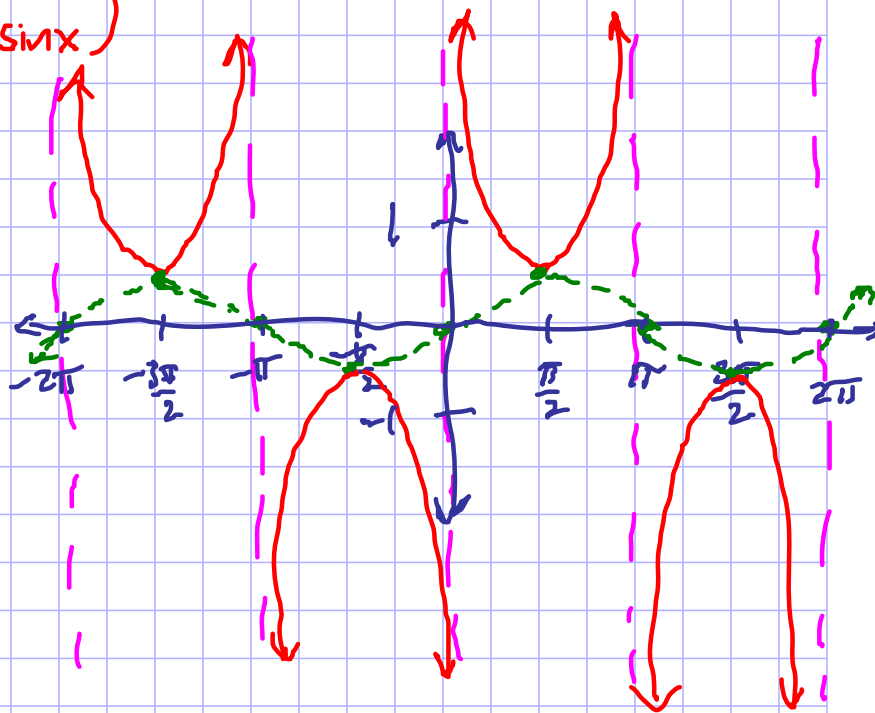
$$\begin{aligned} \text{asymptotes} &= \frac{\pi}{2|b|} + \frac{n\pi}{|b|} \\ &= \frac{\pi}{2} + n\pi \end{aligned}$$



$$18. k(x) = \frac{1}{2} \csc x = \frac{1}{2} \left(\frac{1}{\sin x} \right)$$

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

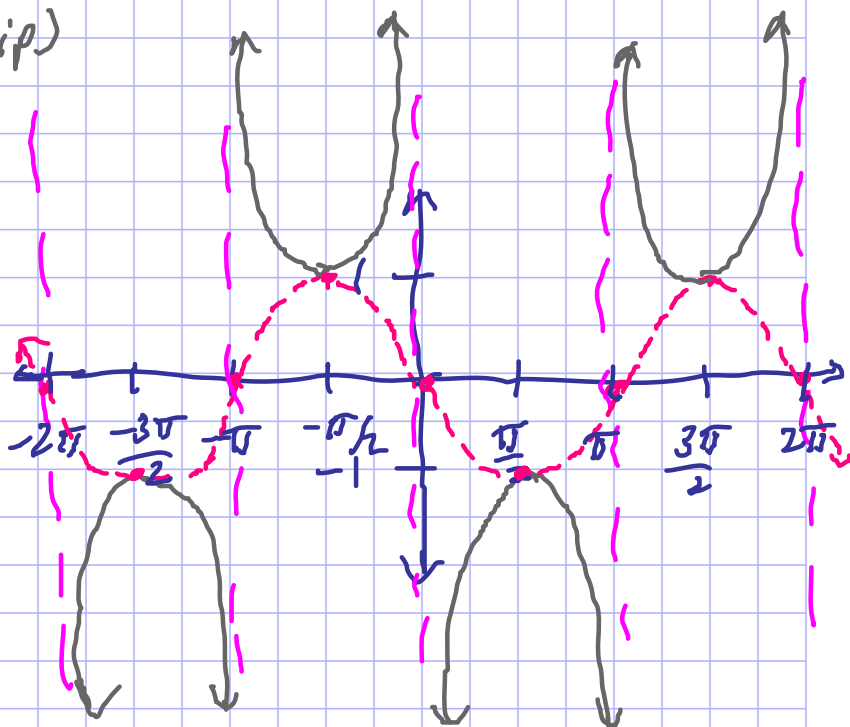
$$\begin{aligned} \text{asymptotes} &= \frac{\pi}{|b|} + \frac{n\pi}{|b|} \\ &= \pi + n\pi \end{aligned}$$



$$19. h(x) = \csc(-x) = \frac{1}{\sin(-x)}$$

$$\text{Period} = \frac{2\pi}{|-1|} = 2\pi \text{ (flip)}$$

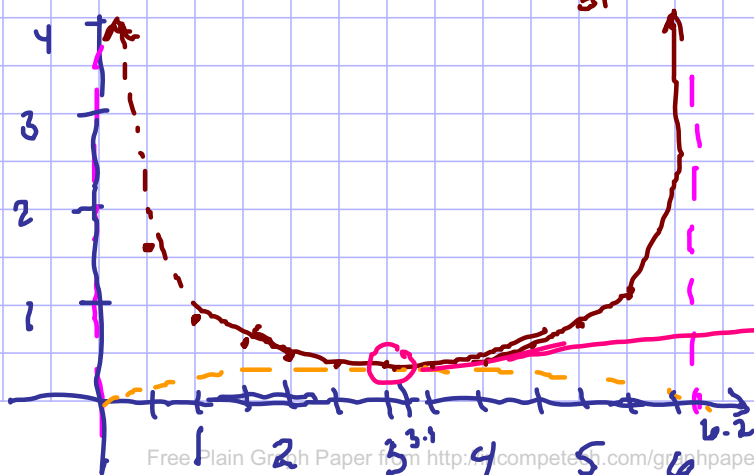
$$\begin{aligned} \text{asymptotes} &= \frac{\pi}{|b|} + \frac{n\pi}{|b|} \\ &= \pi + n\pi \end{aligned}$$



$$20. h(t) = 0.4 \csc \frac{5\pi}{31} t = 0.4 \left(\frac{1}{\sin \frac{5\pi}{31} t} \right)$$

$$\text{per} = \frac{2\pi}{|b|} = \frac{2\pi}{\left(\frac{5\pi}{31}\right)} = \frac{2\pi}{1} \cdot \frac{31}{5\pi} = \frac{62}{5} = 12.4$$

$$\text{asympt} = \frac{\pi}{|b|} + \frac{n\pi}{|b|} = \frac{\pi}{\left|\frac{5\pi}{31}\right|} + \frac{n\pi}{\left|\frac{5\pi}{31}\right|} = \frac{31}{5} + \frac{31n}{5} = 6.2 + 6.2n$$



Use your calculator to help sketch the graph.

min (3.1, 0.4)

(b) Low tide happens at $t=3.1$ (3:06 pm)

(c) The height is 0.4 meters.

(d) The max height will be 3.95 meters and will happen at 6 pm.

$$23. h(\theta) = \sec \theta = \frac{1}{\cos \theta}$$

undefined when $\cos \theta = 0$

$$\theta = \frac{\pi}{2} + n\pi$$

possible answers include

$$\dots, -\frac{7\pi}{2}, -\frac{5\pi}{2}, -\frac{3\pi}{2}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2}, \dots$$

$$24. j(\theta) = \csc \theta = \frac{1}{\sin \theta}$$

undefined when $\sin \theta = 0$

$$\theta = \pi + n\pi$$

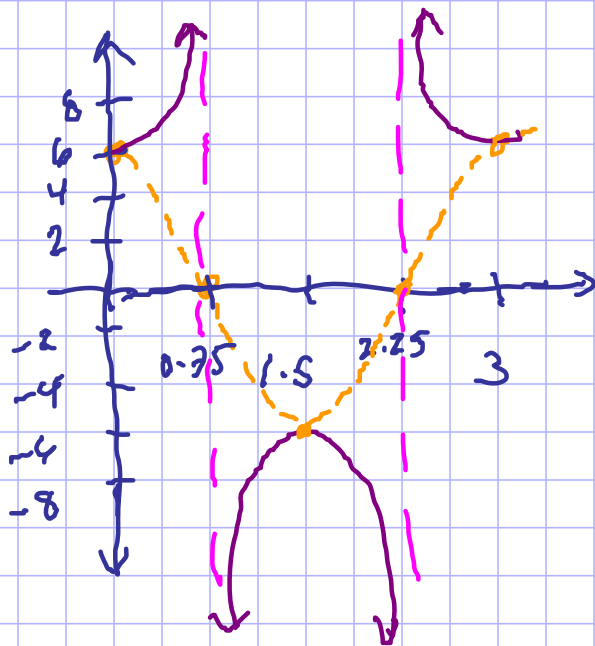
possible answers include

$$\dots, -3\pi, -2\pi, -\pi, 0, \pi, 2\pi, 3\pi, \dots$$

$$25. a(t) = \sec\left(\frac{2\pi}{3}t\right) = \frac{1}{\cos\left(\frac{2\pi}{3}t\right)}$$

$$(a) \text{ per} = \frac{2\pi}{|b|} = \frac{2\pi}{\left|\frac{2\pi}{3}\right|} = \frac{2\pi}{1} \cdot \frac{3}{2\pi} = 3 \text{ seconds}$$

(b)



(c) asymptotes are at $t = 0.75$ & 2.25 seconds.

This is when the light is parallel to the wall.

27-30

| | $0 < x < \frac{\pi}{2}$ | $\frac{\pi}{2} < x < \pi$ | $\pi < x < \frac{3\pi}{2}$ | $\frac{3\pi}{2} < x < 2\pi$ |
|-----|-------------------------|---------------------------|----------------------------|-----------------------------|
| 27. | sin x | ↑ | ↓ | ↑ |
| 28. | csc x | ↓ | ↑ | ↓ |
| 29. | cos x | ↓ | ↓ | ↑ |
| 30. | sec x | ↑ | ↑ | ↓ |

