

14-2 Translations and Reflections

trig. std. 4.0

$$y = a \sin b(x-h) + k \quad h = \text{horizontal shift}$$

$$y = a \cos b(x-h) + k \quad k = \text{vertical shift}$$

$$y = a \tan b(x-h) + k \quad \text{if } a < 0, \text{ reflect graph over the line } y = k$$

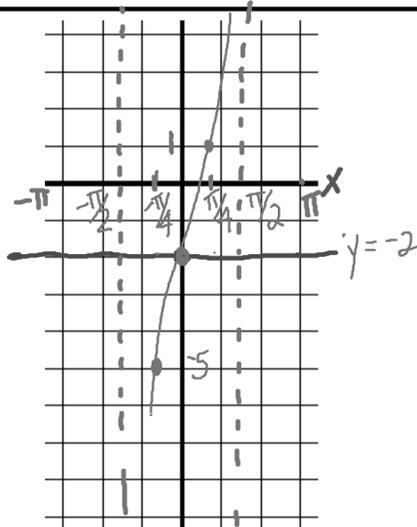
ex. 1

$$y = -2 + 3 \tan x$$

$$y = 3 \tan x - 2$$

$$\text{period} = \pi \quad \downarrow 2$$

$$\pm a = \pm 3$$



ex. 2

$$y = 3 - \frac{1}{2} \cos \pi x$$

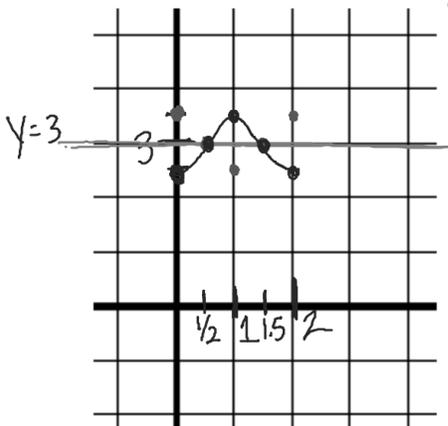
$$y = 3 - \frac{1}{2} \cos \pi x + 3$$

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

$$\text{amp} = \frac{1}{2}$$

up 3

flip



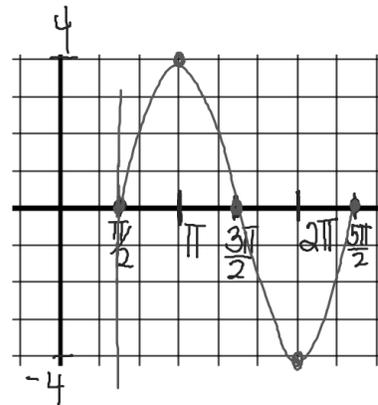
ex. 3

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

$$\text{per} = 2\pi$$

$$\text{amp} = 4$$

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



ex. 4

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

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

