

Recall:

For a Trigonometric function of the form $y = af\left[b\left(x + \frac{c}{b}\right)\right] + d$,

Amplitude = $|a|$ (note that amplitude is always positive)

Period = $\frac{\text{original period of the function } (\pi \text{ or } 2\pi)}{|b|}$

Horizontal shift = $\frac{c}{b}$, left if $\frac{c}{b} > 0$, right if $\frac{c}{b} < 0$

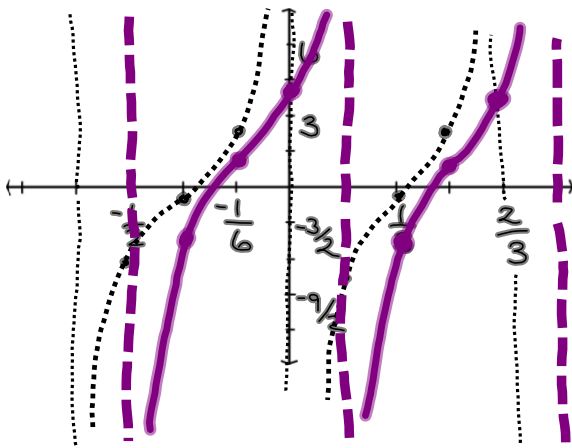
Vertical shift = d , up if $d > 0$, down if $d < 0$

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

$$= -3 \cot\left(\frac{3\pi}{2}\left(x - \frac{1}{6}\right)\right) + \frac{3}{2}$$

amp: 3
 per: $\frac{\pi}{3\pi/2} = \frac{\pi}{1} \cdot \frac{2}{3\pi} = \frac{2}{3}$
 h.shift: right $\frac{1}{6}$
 v.shift: up $\frac{3}{2}$

$$\frac{\pi/4}{3\pi/2} = \frac{\pi/4 \cdot 2}{3\pi} = \frac{1}{6}$$



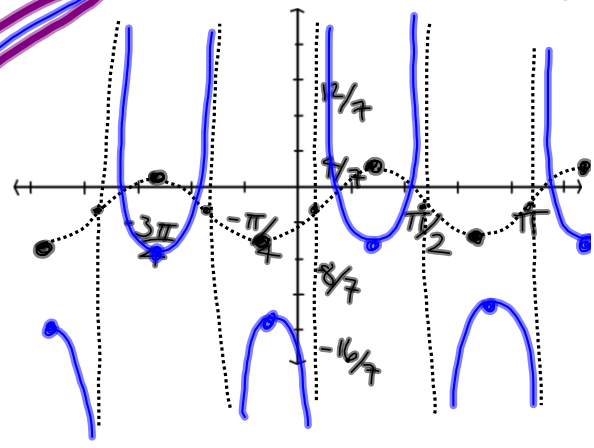
$$y = \frac{4}{7} \csc 2x - \frac{8}{7}$$

amp: $\frac{4}{7}$

per: π

h.shift: none

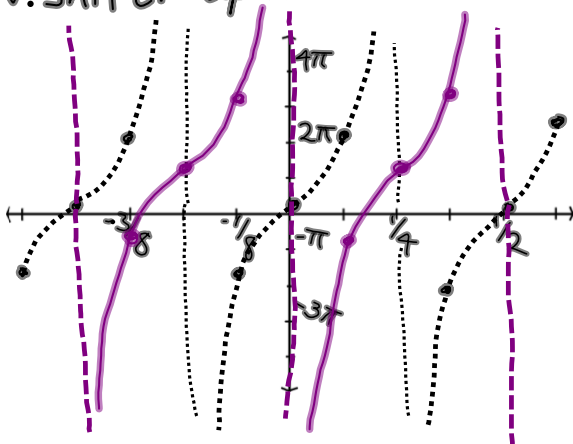
v.shift: down $\frac{8}{7}$



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

$$= 2\pi \tan 2\pi\left(x - \frac{1}{4}\right) + \pi$$

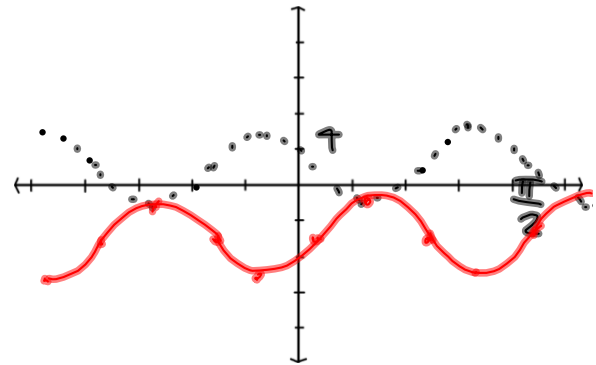
amp: 2π
 per: $\frac{\pi}{2\pi} = \frac{1}{2}$
 h.shift: right $\frac{1}{4}$
 v.shift: up π



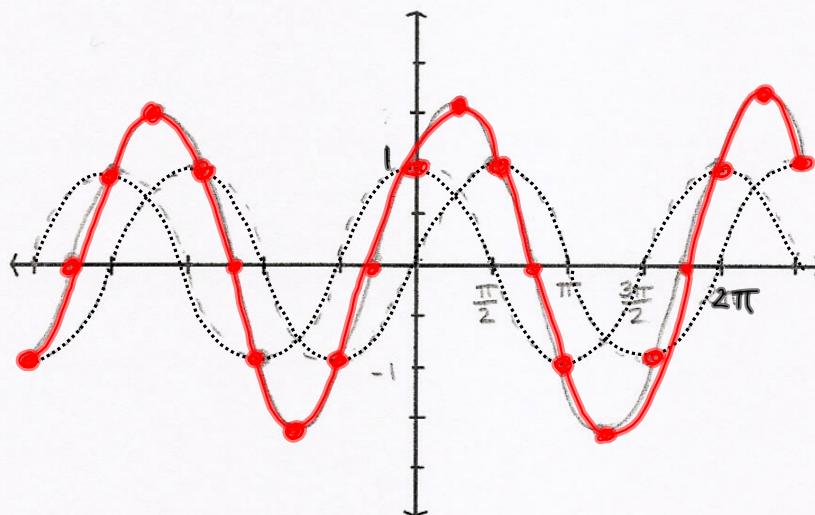
$$y = -4 \sin\left(4x + \pi\right) - 8$$

$$= -4 \sin 4\left(x + \frac{\pi}{4}\right) - 8$$

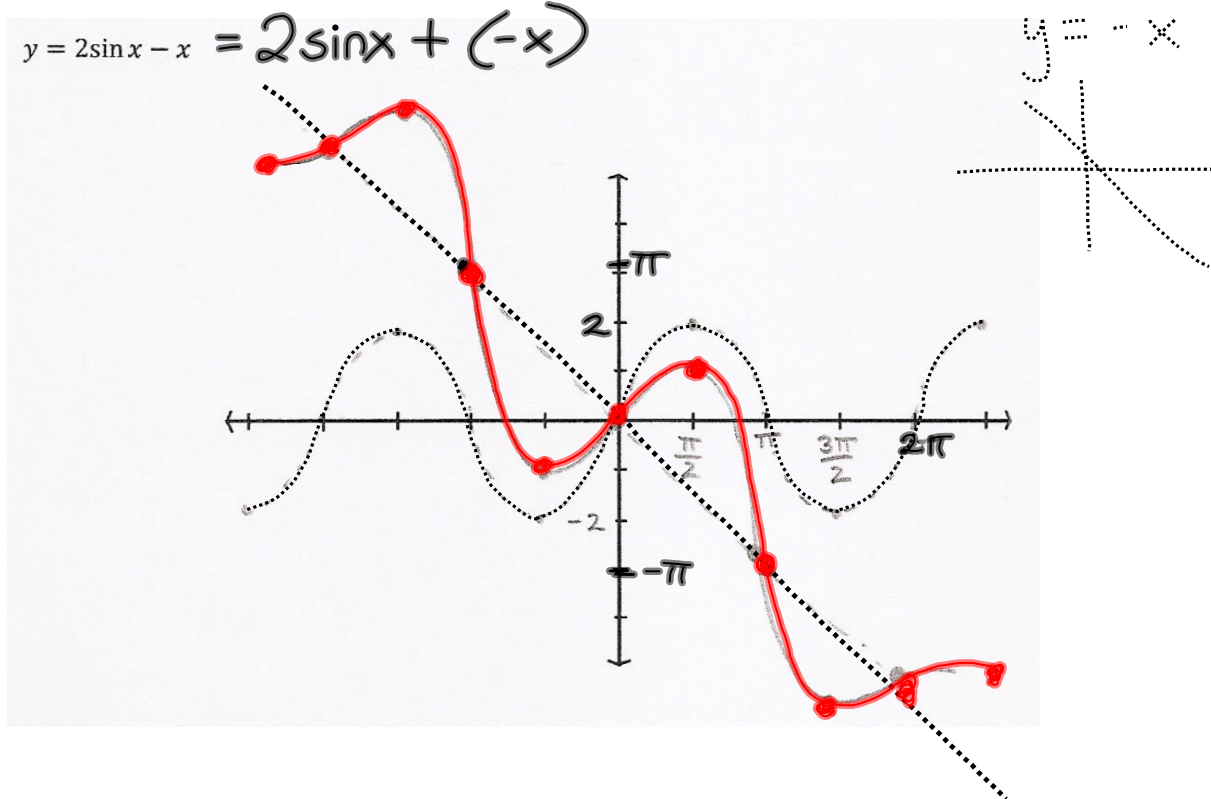
amp: 4
 per: $\pi/2$
 h.shift: left $\pi/4$
 v.shift: down 8



$y = \sin x + \cos x$



$$y = 2\sin x - x = 2\sin x + (-x)$$



$$y = 2\sin 2x - \cos x = 2\sin 2x + (-\cos x)$$

amp 2
per π
amp 1
per 2π

