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)

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

$$\text{Horizontal shift} = \frac{c}{b}\ ,\quad \begin{matrix} left\ if\ \frac{c}{b}>0 \\ right\ if\ \frac{c}{b}<0 \end{matrix}$$

$$\text{Vertical shift} = d\ ,\quad \begin{matrix} up\ if\ d>0 \\ down\ if\ d<0 \end{matrix}$$

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

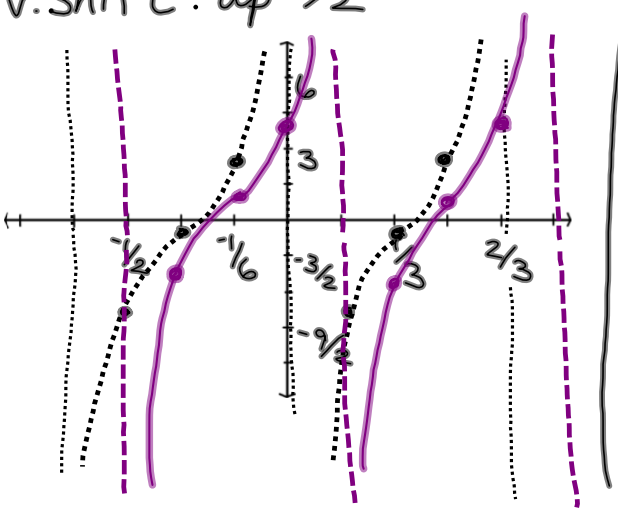
$= -3\cot\frac{3\pi}{2}\left(x - \frac{1}{6}\right) + \frac{3}{2}$

amp: 3

per: $\frac{\pi}{3\pi/2} = \pi \cdot \frac{2}{3\pi} = \frac{2}{3}$ $\quad \frac{\pi}{4} \div \frac{3\pi}{2} = \frac{\pi}{4} \cdot \frac{2}{3\pi}$

h. shift: right 1/6

v. shift: up 3/2



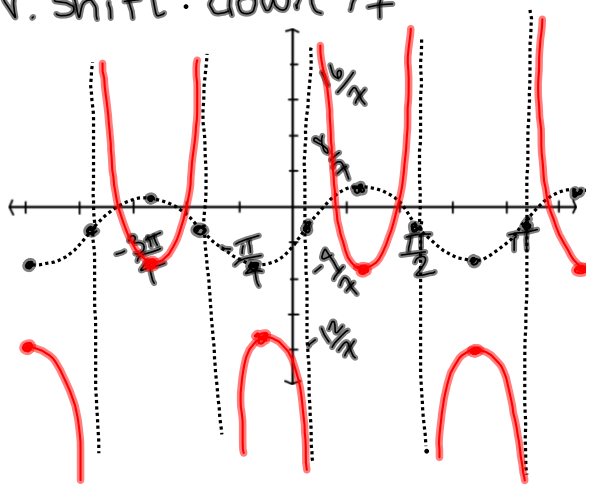
$y = \frac{4}{7}\csc 2x - \frac{8}{7}$

amp: 4/7

per: π

h. shift: none

v. shift: down 8/7



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

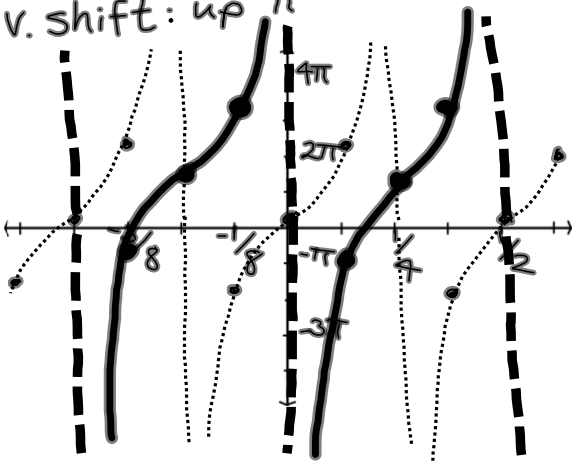
$= 2\pi \tan 2\pi\left(x - \frac{1}{4}\right) + \pi$

amp: 2π

per: $\frac{\pi}{2\pi} = \frac{1}{2}$

h. shift: right $\frac{1}{4}$

v. shift: up π



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

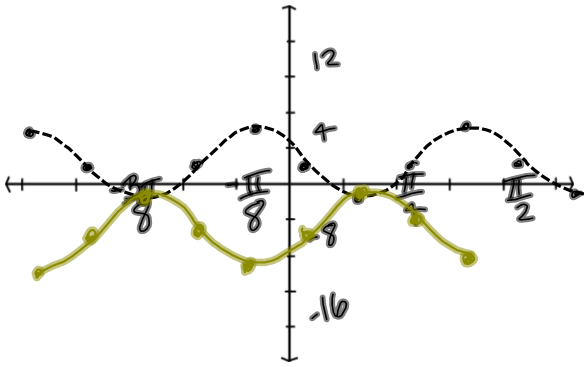
$= -4\sin 4\left(x + \frac{\pi}{4}\right) - 8$

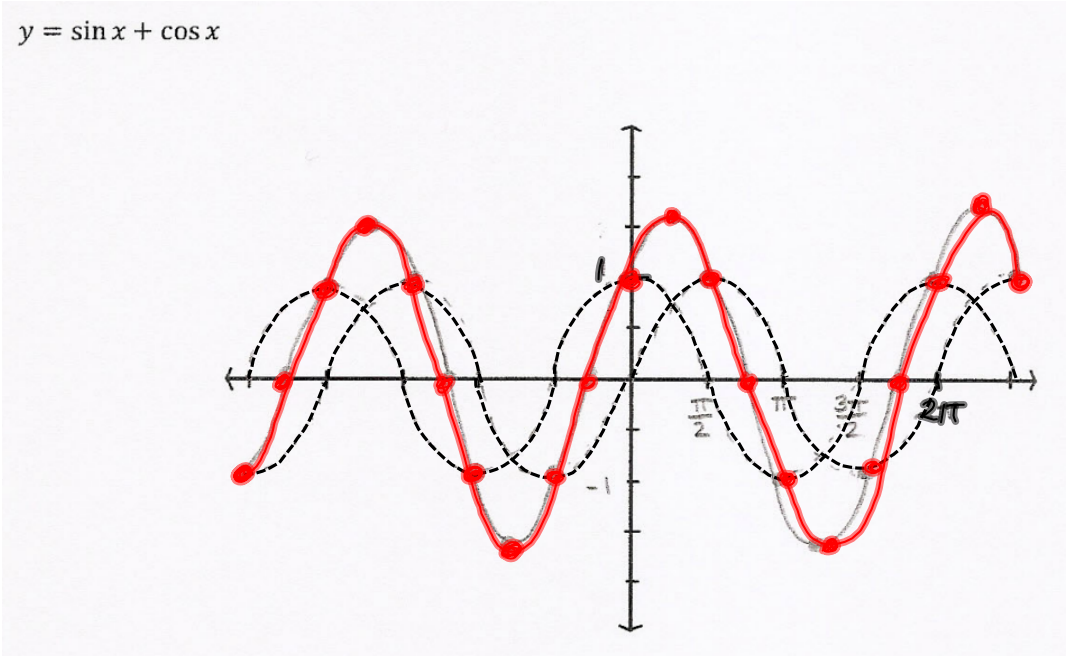
amp: 4

per: $\frac{2\pi}{4} = \frac{\pi}{2}$

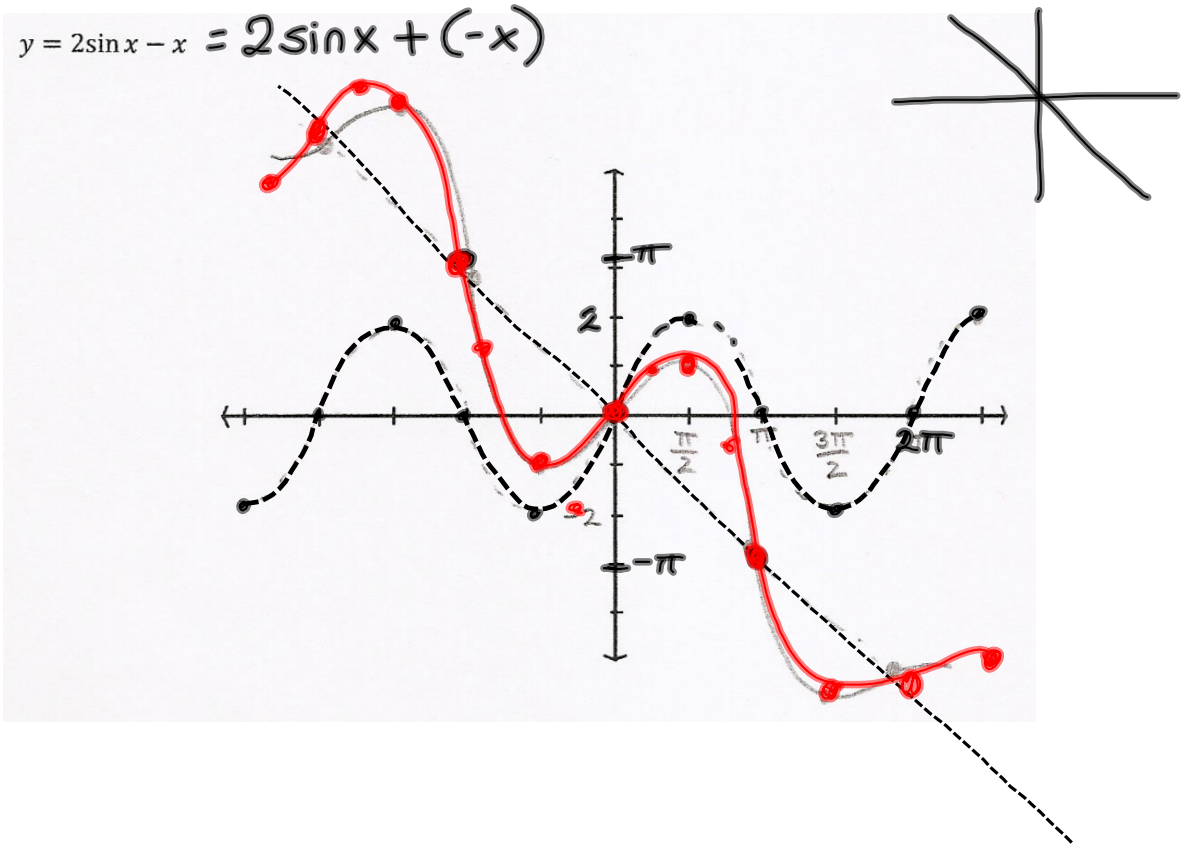
h. shift: left $\frac{\pi}{4}$

v. shift: down 8





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



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

amp 2, per π — amp 1, per 2π