

$$\frac{1}{7} = \frac{1/50}{7/50}$$

$$= \frac{1/3600}{7/3600}$$

(1)

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

horiz shift right — adds  $\frac{\pi}{4}$  to x-vals

v. shift up } add 2 to y-vals

(2nd)

Anchor pts:  $0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi$

$+\frac{\pi}{4}$  ↓  $+\frac{\pi}{4}$  ↓  $+\frac{\pi}{4}$  ↓  $+\frac{\pi}{4}$  ↓  $+\frac{\pi}{4}$  ↓

$\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}, \frac{9\pi}{4}$

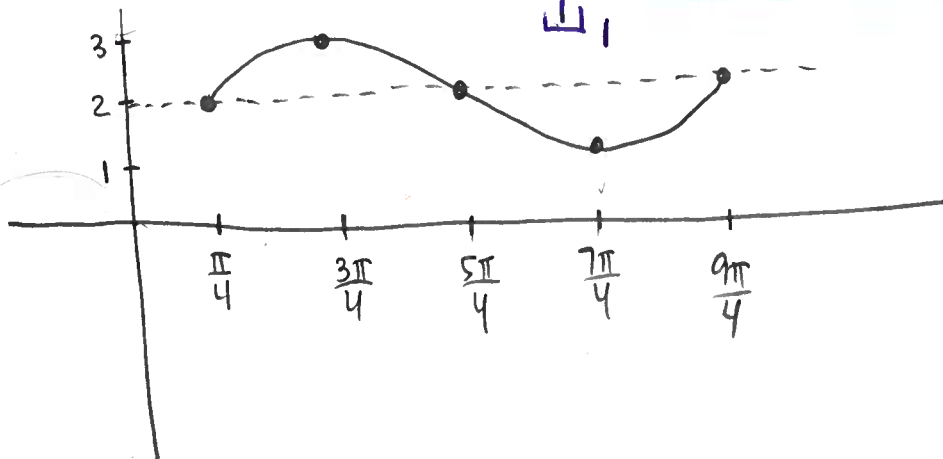
$$\frac{\pi}{2} + \frac{\pi}{4} = \frac{2\pi}{4} + \frac{\pi}{4}$$

$$\pi + \frac{\pi}{4} = \frac{4\pi}{4} + \frac{\pi}{4} = \frac{5\pi}{4}$$

$$\frac{3\pi}{2} + \frac{\pi}{4} = \frac{6\pi}{4} + \frac{\pi}{4} = \frac{7\pi}{4}$$

$$\frac{2\pi}{1} + \frac{\pi}{4} = \frac{8\pi}{4} + \frac{\pi}{4} = \frac{9\pi}{4}$$

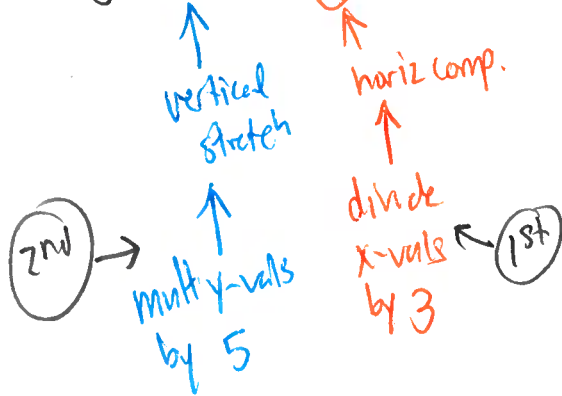
v. shift:  $\begin{matrix} 1 \\ | \\ 0 \leftarrow \text{midline} \\ | \\ -1 \end{matrix} \xrightarrow{\text{add 2}} \begin{matrix} 3 \\ | \\ 2 \leftarrow \text{new midline} \\ | \\ 1 \end{matrix}$



(2)

Ex: Plot

$$y = 5 \cos(3x)$$

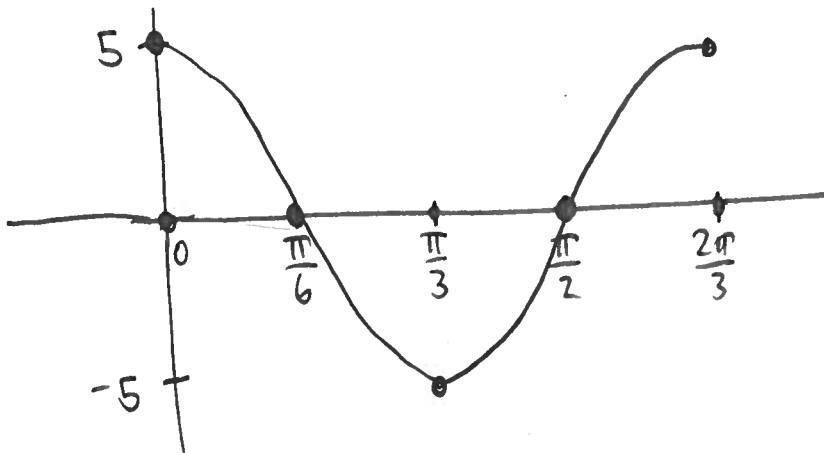
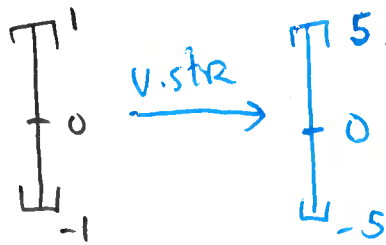


$$\frac{\frac{\pi}{2}}{\frac{3}{1}} = \left(\frac{\pi}{2}\right)\left(\frac{1}{3}\right) = \frac{\pi}{6}$$

Soln: Anchor pts:  $0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi$

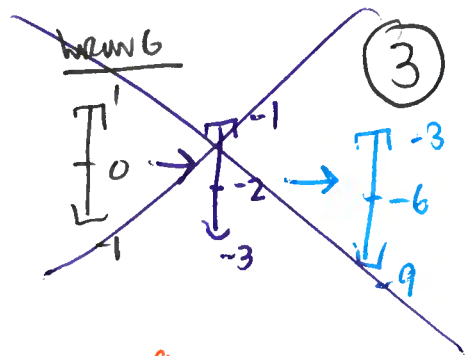
$\div 3 \downarrow$      $\downarrow$      $\downarrow$      $\downarrow$      $\downarrow$   
 $0, \frac{\pi}{6}, \frac{\pi}{3}, \frac{\pi}{2}, \frac{2\pi}{3}$

$$\frac{\frac{3\pi}{2}}{\frac{3}{1}} = \left(\frac{3\pi}{2}\right)\left(\frac{1}{3}\right) = \frac{\pi}{2}$$



Plot  $y = 3\sin(5x) - 2$

$\uparrow$  v.str. mult y-vals by 3 2nd  
 $\uparrow$  h.comp div x-vals by 5 1st  
 $\uparrow$  v.shift subtr 2 from y-vals 3rd



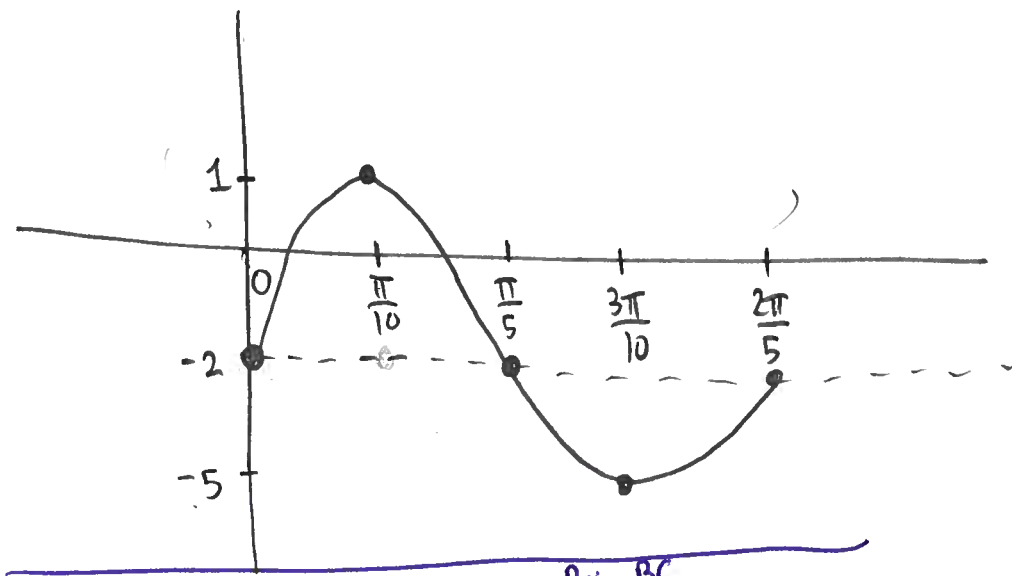
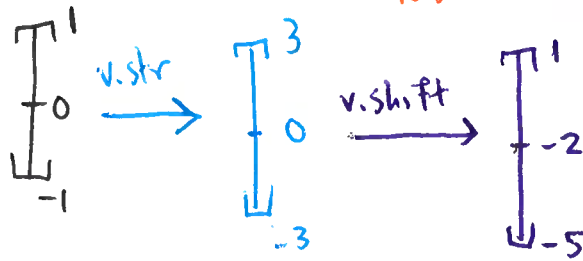
$$\frac{q}{\frac{b}{\frac{c}{d}}} = \frac{q}{b} \cdot \frac{d}{c}$$

Soln: Anchor pts:  $0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi$

$$\frac{\frac{\pi}{2}}{\frac{5}{1}} = \frac{\pi}{2} \cdot \frac{1}{5} = \frac{\pi}{10}$$

$\downarrow$

$0, \frac{\pi}{10}, \frac{2\pi}{5}, \frac{3\pi}{10}, \frac{4\pi}{5}$



$y = A \text{ trig}(B(x-C)) + D$

$\uparrow$  3rd  $\uparrow$  1st  $\uparrow$  2nd  $\uparrow$  4th  
 Bx - BC