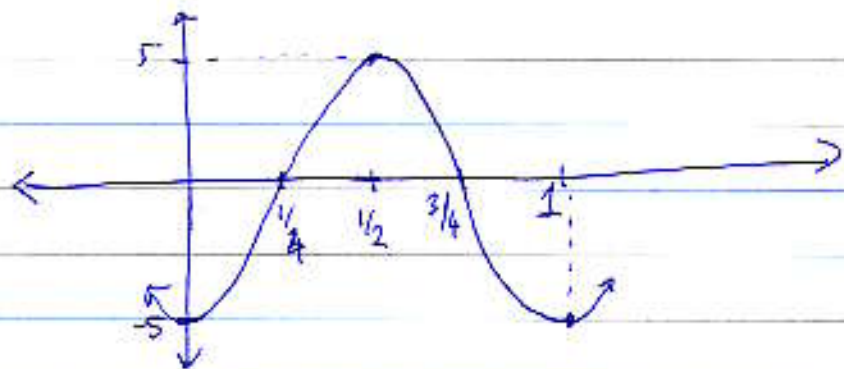
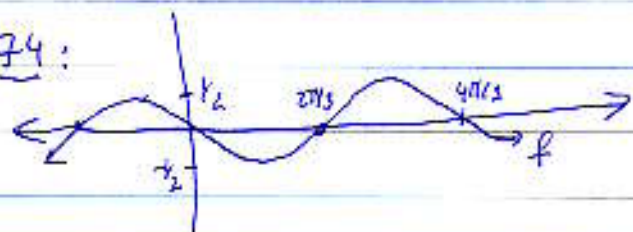


8.6.48: $y = -2 \sin\left(\frac{1}{2}x\right)$ matches with (D) (~~same~~ $A=2$
 $P=4\pi$)

8.6.58: $y = -5 \cos(2\pi x)$ $A=5$ $P=1$



8.6.74:



$A = \frac{1}{2}$ $P = \frac{4\pi}{3} \Rightarrow \omega = \frac{2\pi}{P} = \frac{3}{2}$

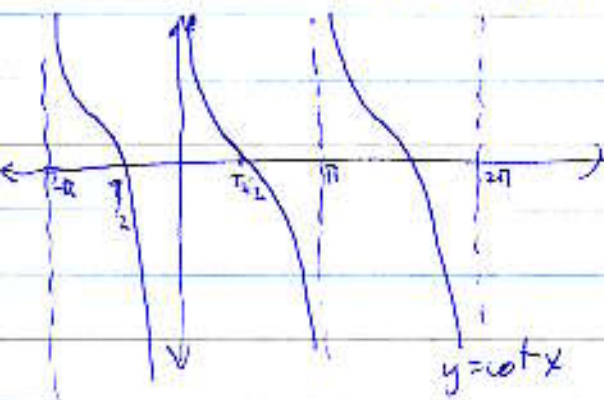
$f(0) = 0 \Rightarrow \sin$

$f\left(\frac{\pi}{3}\right) = -\frac{1}{2} \Rightarrow -\sin$

$\Rightarrow f(x) = -\frac{1}{2} \sin\left(\frac{3}{2}x\right)$

8.7.20: $y = \cot(x - \pi)$

$y = \cot x \xrightarrow{\text{shift right } \pi\text{-unit}} y = \cot(x - \pi)$

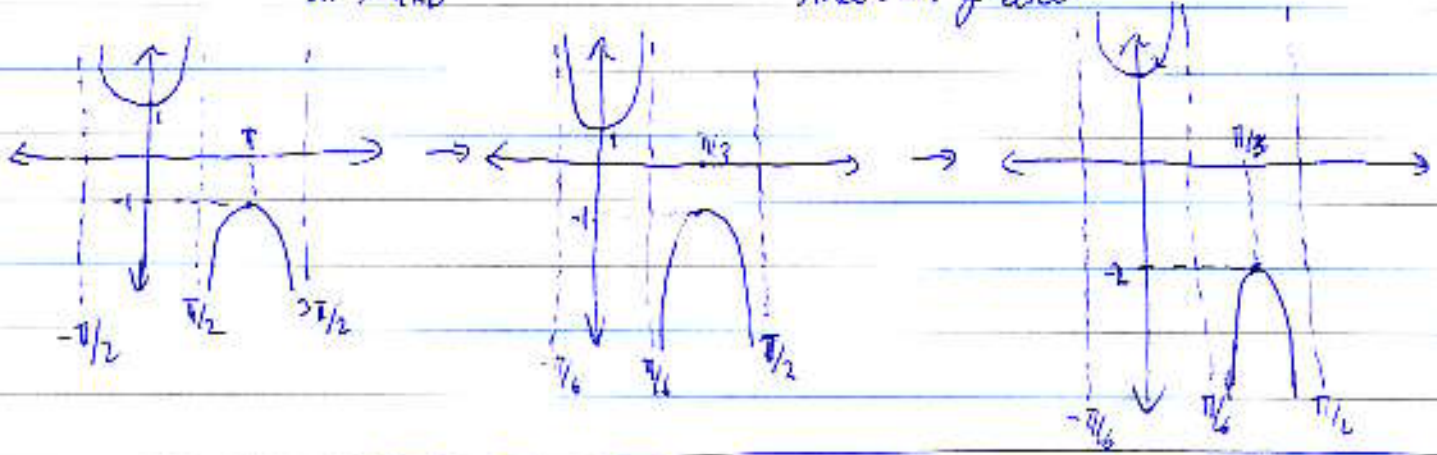


\rightarrow shifting π unit to the right gives the same graphs //

so $\cot(\pi - x) = -\cot x$

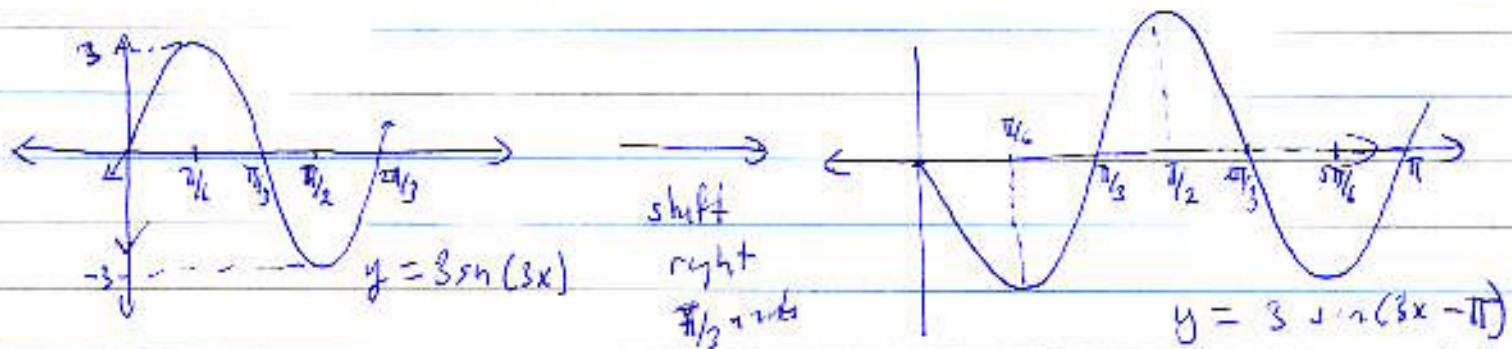
8.7.30 : $y = 2 \sec(3x)$

$y = \sec x$ $\xrightarrow[\text{stretch on } x\text{-axis}]{\text{compress}}$ $y = \sec(3x)$ $\xrightarrow[\text{stretch on } y\text{-axis}]{\text{stretch}}$ $y = 2 \sec(3x)$



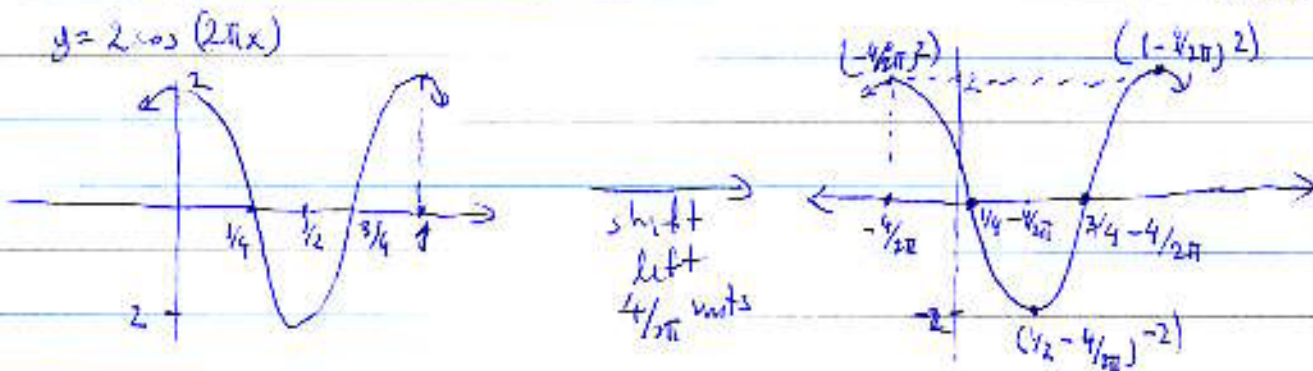
8.8.2 : $y = 3 \sin(3x - \pi)$
 $= 3 \sin(3(x - \pi/3))$

$A=3$ $P = \frac{2\pi}{3}$ Phase Shift: $\pi/3$



8.5.8 : $y = 2 \cos(2\pi x + 4) = 2 \cos(2\pi(x + \frac{4}{2\pi}))$ $A=2$ $P=1$

Phase Shift: $-\frac{4}{2\pi}$



8.5.16: $A=2, P=\pi, P. Shift: -2 \Rightarrow y = 2\sin(2(x+2)) = 2\sin(2x+4)$

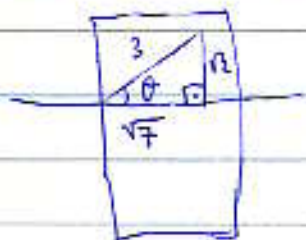
9.1.10: $y = \sin^{-1}\left(-\frac{\sqrt{3}}{2}\right) \Rightarrow \sin y = -\frac{\sqrt{3}}{2}$ and $-\frac{\pi}{2} < y < \frac{\pi}{2}$
 $\Rightarrow y = -\frac{\pi}{3}$

9.1.34: $\sin^{-1}\left(\sin\left(\frac{2\pi}{3}\right)\right) = \sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{3}$ (not $\frac{2\pi}{3}$)
($\sin \theta = \frac{\sqrt{3}}{2}$ and $\frac{\pi}{2} < \theta < \frac{3\pi}{2}$)

9.1.38: $\cos^{-1}\left(\cos\left(\frac{2\pi}{3}\right)\right) = \cos^{-1}\left(-\frac{1}{2}\right) = \frac{2\pi}{3}$
($\cos \theta = -\frac{1}{2}$ $0 < \theta < \pi$)

9.2.14: $\tan^{-1}\left(\tan\left(\frac{2\pi}{3}\right)\right) = \tan^{-1}\left(-\sqrt{3}\right) = \theta = -\frac{\pi}{3}$
 $\tan \theta = -\sqrt{3}$ $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$

9.2.20: $\cos\left(\sin^{-1}\left(\frac{\sqrt{7}}{3}\right)\right) = \cos \theta = \frac{\sqrt{7}}{3}$



9.2.28: $\cos^{-1}\left(\sin\left(\frac{7\pi}{6}\right)\right) = \cos^{-1}\left(-\frac{1}{2}\right) = \theta = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$
 $\cos \theta = -\frac{1}{2}$ $0 < \theta < \pi$

9.4.20: $\cos \theta = \frac{1}{4}$ $-\frac{\pi}{2} < \theta < 0$

a) $\sin \theta = -\frac{\sqrt{15}}{4}$ $\tan \theta = -\sqrt{15}$

b) $\sin\left(\theta - \frac{\pi}{6}\right) = \left(-\frac{\sqrt{15}}{4}\right)\left(\frac{\sqrt{2}}{2}\right) - \left(\frac{1}{4}\right)\left(\frac{1}{2}\right)$

d) $\tan\left(\theta - \frac{\pi}{4}\right) = \frac{-\sqrt{15} - (-1)}{1 + (-\sqrt{15})(1)}$

c) $\cos\left(\theta + \frac{\pi}{3}\right) = \left(\frac{1}{4}\right)\left(\frac{1}{2}\right) - \left(-\frac{\sqrt{15}}{4}\right)\left(\frac{\sqrt{3}}{2}\right)$

$$\begin{aligned}
 1.3.16: \quad \tan^2 \theta \cos^2 \theta + \cot^2 \theta \sin^2 \theta &= \frac{\sin^2 \theta}{\cos^2 \theta} \cos^2 \theta + \frac{\cos^2 \theta}{\sin^2 \theta} \sin^2 \theta \\
 &= \sin^2 \theta + \cos^2 \theta \\
 &= 1
 \end{aligned}$$

$$1.3.26: \quad \frac{\cos \theta - 1}{\cos \theta + 1} = \frac{\frac{1}{\sin \theta} - 1}{\frac{1}{\sin \theta} + 1} = \frac{(1 - \sin \theta) / \sin \theta}{(1 + \sin \theta) / \sin \theta} = \frac{1 - \sin \theta}{1 + \sin \theta}$$

$$\begin{aligned}
 1.3.34: \quad 1 - \frac{\sin^2 \theta}{1 + \cos \theta} &= 1 - \frac{\sin^2 \theta (1 - \cos \theta)}{1 \cdot \cos^2 \theta} = 1 - \frac{\sin^2 \theta (1 - \cos \theta)}{\sin^2 \theta} \\
 (1 - \cos \theta) &= 1 - (1 - \cos \theta) \\
 &= \cos \theta
 \end{aligned}$$

$$\begin{aligned}
 1.4.2: \quad \sin(\pi/12) &= \sin(\pi/3 - \pi/4) = \sin \pi/3 \cos \pi/4 - \cos \pi/3 \sin \pi/4 \\
 &= \left(\frac{\sqrt{3}}{2}\right) \left(\frac{\sqrt{2}}{2}\right) - \left(\frac{1}{2}\right) \left(\frac{\sqrt{2}}{2}\right) //
 \end{aligned}$$

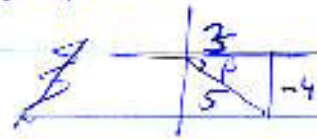
$$\begin{aligned}
 1.4.8: \quad \tan(135) &= \tan(150 + 45) = \frac{\tan(150) + \tan 45}{1 - \tan 150 \tan 45} = \frac{-1/\sqrt{3} + 1}{1 - (-1/\sqrt{3})(1)} // \\
 \tan 150 &= -\frac{1}{\sqrt{3}} \quad \tan 45 = 1
 \end{aligned}$$

$$1.4.24: \quad \cos \alpha = \frac{\sqrt{20}}{5} \quad 0 < \alpha < \pi/2, \quad \sin \beta = -4/5 \quad \pi/2 < \beta < \pi$$

$$\begin{aligned}
 \sin \alpha &= \frac{\sqrt{20}}{5} \\
 \tan \alpha &= \frac{\sqrt{20}}{\sqrt{5}} = 2
 \end{aligned}$$



$$\begin{aligned}
 \cos \beta &= 3/5 \\
 \tan \beta &= -4/3
 \end{aligned}$$



$$a) \quad \sin(\alpha + \beta) = \left(\frac{\sqrt{20}}{5}\right) \left(\frac{3}{5}\right) + \left(-\frac{4}{5}\right) \left(\frac{\sqrt{5}}{5}\right)$$

$$b) \quad \cos(\alpha + \beta) = \left(\frac{3}{5}\right) \left(\frac{\sqrt{5}}{5}\right) - \left(\frac{\sqrt{20}}{5}\right) \left(-\frac{4}{5}\right)$$

$$c) \quad \sin(\alpha - \beta) = \left(\frac{\sqrt{20}}{5}\right) \left(\frac{3}{5}\right) - \left(-\frac{4}{5}\right) \left(\frac{\sqrt{5}}{5}\right)$$

$$d) \quad \tan(\alpha - \beta) = \frac{2 - (-4/3)}{1 + (2)(-4/3)}$$