

## Sample Review Problems

Graph one cycle of:

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

②  $y = 3 \cos 4x - 3$

③  $y = 2 \tan\left(\frac{x}{2}\right) + 3$

- ④ Write a sine & a cosine equation for a periodic graph w/ a minimum at  $(-2, -4)$  & a maximum at  $(2, 2)$ .

Solve each equation:

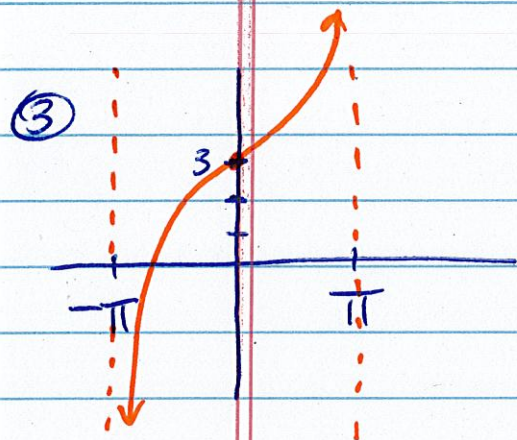
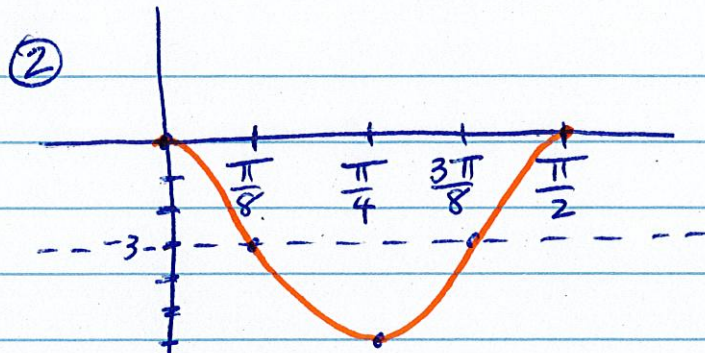
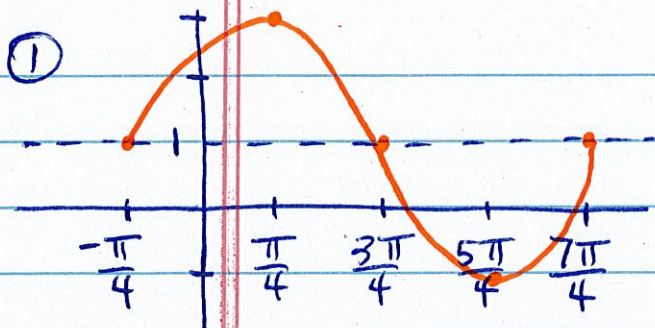
⑤  $4 \cos^2 x - 1 = 0$  on  $[-3\pi, 3\pi]$

⑥  $\sin x - \sin 2x = 0$  on  $[-\pi, \pi]$

⑦  $\cos 2x - \cos^2 x = 0$  on  $[0, 2\pi]$

⑧  $2 \sin\left(x + \frac{\pi}{2}\right) - 1 = 0$  on  $[0, 2\pi]$

# Sample Review Answers



④  $D = -1 \left( \frac{\text{max} + \text{min}}{2} \right)$   
 $A = 3 \left( \text{max} - D \right)$   
 Period = 8, so  $B = \frac{\pi}{4}$   
 $y = 3 \sin \frac{\pi}{4} x - 1$   
 $y = 3 \cos \frac{\pi}{4} (x - 2) - 1$

⑤  $\cos^2 x = \frac{1}{4} \quad [-3\pi, 3\pi]$   
 $\cos x = \pm \frac{1}{2}$

$$x = \pm \frac{\pi}{3}, \pm \frac{2\pi}{3}, \pm \frac{4\pi}{3}, \pm \frac{5\pi}{3}, \pm \frac{7\pi}{3}, \pm \frac{8\pi}{3}$$

⑥  $\sin x - 2 \sin x \cos x = 0 \quad [-\pi, +\pi]$   
 $\sin x (1 - 2 \cos x) = 0$   
 $\sin x = 0 \quad \cos x = \frac{1}{2}$

$$x = -\pi, -\frac{\pi}{3}, 0, \frac{\pi}{3}, \pi$$

$$\textcircled{7} \quad 2\cos^2 x - 1 - \cos^2 x = 0 \quad 0 \leq x \leq 2\pi$$

$$\cos^2 x - 1 = 0$$

$$\cos^2 x = 1$$

$$\cos x = \pm 1$$

$$x = 0, \pi, 2\pi$$

$$0 \leq x \leq 2\pi$$

$$\textcircled{8} \quad \sin\left(x + \frac{\pi}{2}\right) = \frac{1}{2} \quad \frac{\pi}{2} \leq x + \frac{\pi}{2} \leq \frac{5\pi}{2}$$

$$x + \frac{\pi}{2} = \frac{5\pi}{6}, \frac{13\pi}{6}$$

$$x = \frac{\pi}{3}, \frac{5\pi}{3}$$