

$$1) y = 4 \sin(4\theta + \frac{5\pi}{3}) + 2$$

$$4 \sin 4(\theta + \frac{5\pi}{12}) + 2$$

Graph all 6  
worksheet Key

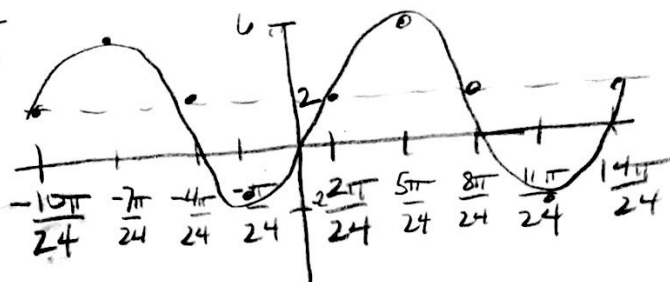
$$a = 4$$

$$p = \frac{2\pi}{4} = \frac{\pi}{2} \quad \checkmark \frac{12\pi}{24}$$

$$c = -\frac{5\pi}{12} \left( \frac{-10\pi}{24} \right)$$

$$d = 2$$

$$kp: \frac{\pi}{8} \rightarrow \frac{3\pi}{24}$$



$$4x = \frac{5\pi}{3}$$

$$2) y = \frac{1}{2} \sin(\theta + \frac{5\pi}{6}) - 2$$

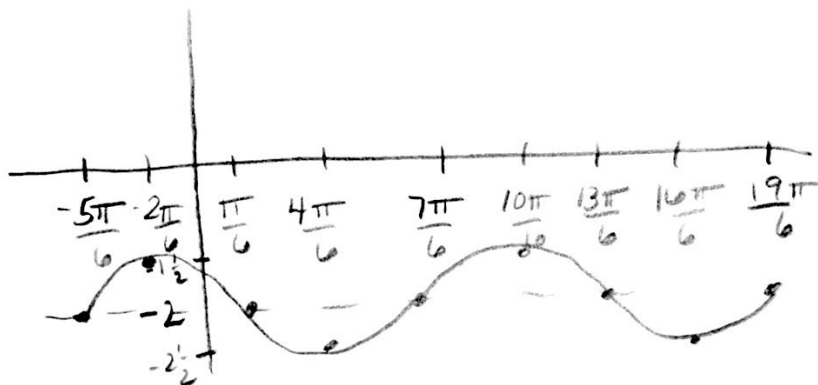
$$a = \frac{1}{2}$$

$$p = 2\pi \left( \frac{12\pi}{6} \right)$$

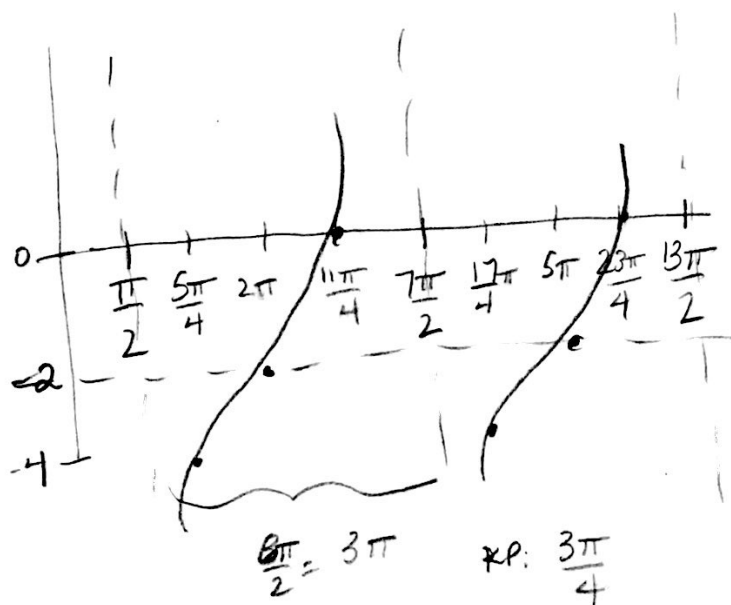
$$c = -\frac{5\pi}{6}$$

$$d = -2$$

$$kp: \frac{\pi}{2} \left( \frac{3\pi}{6} \right)$$



$$3) y = 2 \tan(\frac{\theta}{3} - \frac{2\pi}{3}) - 2$$



$$\frac{\theta}{3} - \frac{2\pi}{3} = -\frac{\pi}{2}$$

$$\frac{\theta}{3} = -\frac{3\pi}{6} + \frac{4\pi}{6}$$

$$3 \cdot \frac{\theta}{3} = \frac{\pi}{6} \cdot 3$$

$$\theta = \frac{\pi}{2}$$

$$\frac{\theta}{3} - \frac{2\pi}{3} = \frac{\pi}{2}$$

$$3 \cdot \frac{\theta}{3} = \frac{7\pi}{6} \cdot 3$$

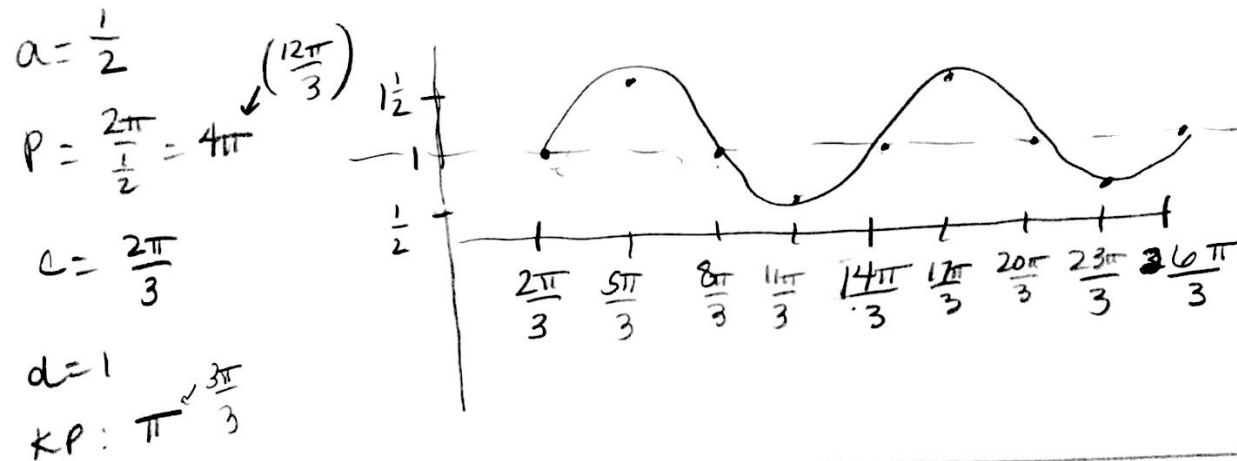
$$\theta = \frac{7\pi}{2}$$

$$1) y = \frac{1}{2} \sin\left(\frac{\theta}{2} - \frac{\pi}{3}\right) + 1$$

$$\frac{1}{2} \sin \frac{1}{2}\left(\theta - \frac{2\pi}{3}\right) + 1$$

$$2 \cdot \frac{1}{2} x = \frac{\pi}{3} \cdot 2$$

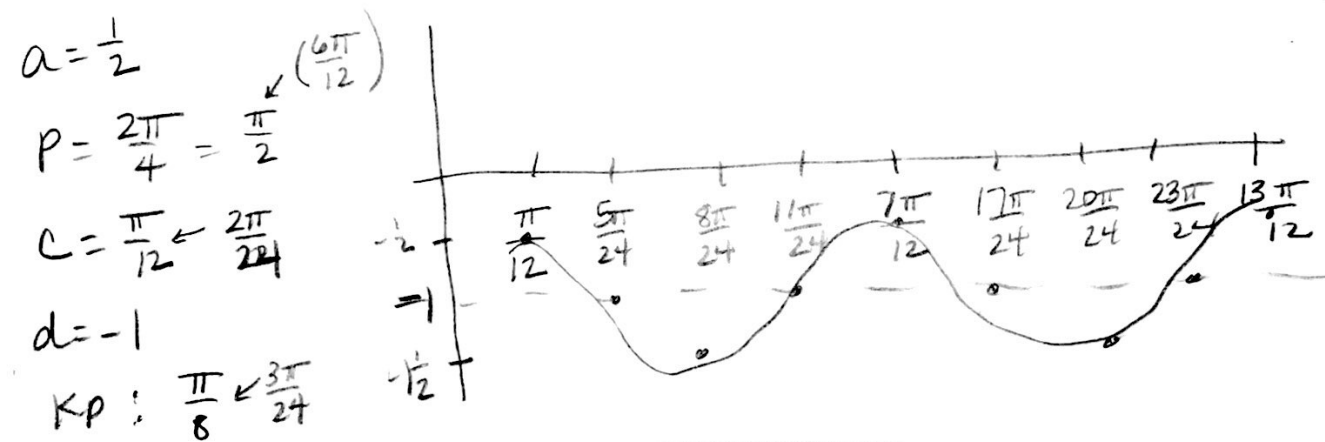
$$x = \frac{2\pi}{3}$$



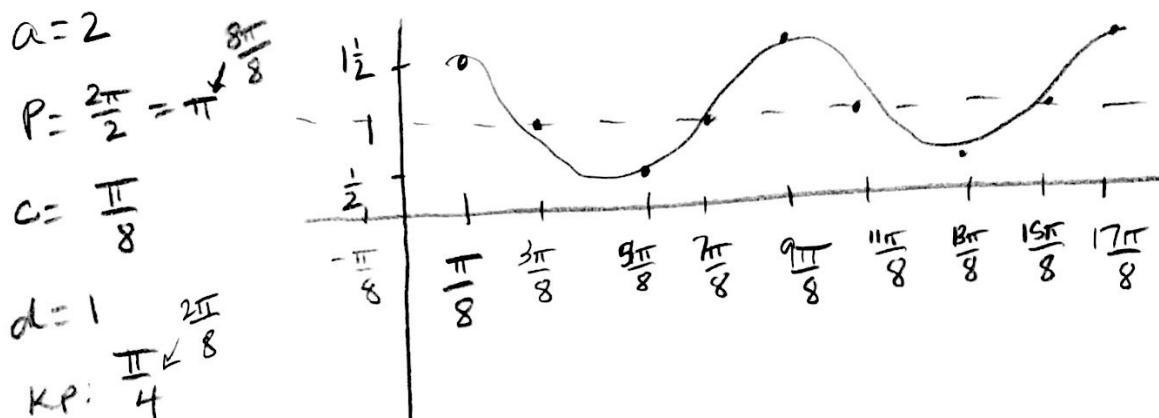
$$5) y = \frac{1}{2} \cos\left(4\theta - \frac{\pi}{3}\right) - 1$$

$$= \frac{1}{2} \cos 4\left(\theta - \frac{\pi}{12}\right) - 1$$

$$\frac{1}{4} \cdot 4x = \frac{\pi}{3} \cdot \frac{1}{4}$$



$$6) y = \frac{1}{2} \cos 2\left(\theta - \frac{\pi}{8}\right) + 1$$



$$y = 2 \sin \frac{1}{3} \left( \theta + \frac{3\pi}{4} \right) + 1$$

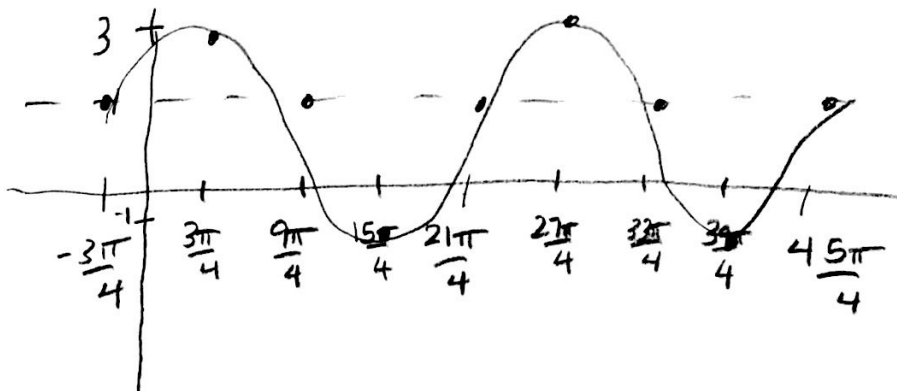
$$a = 2$$

$$P = \frac{2\pi}{\frac{1}{3}} = 6\pi \quad \swarrow \frac{24\pi}{4}$$

$$C = -\frac{3\pi}{4}$$

$$d = 1$$

$$kp: \frac{6\pi}{4}$$



$$8) \quad y = \sin 3\theta$$

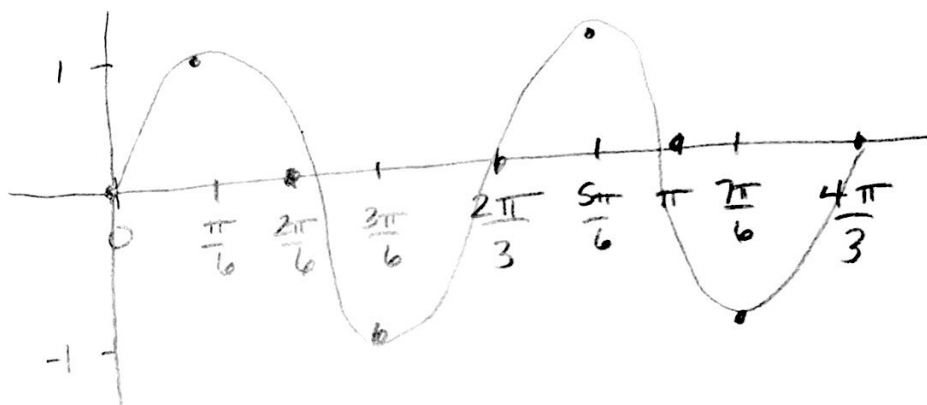
$$a = 1$$

$$P = \frac{2\pi}{3}$$

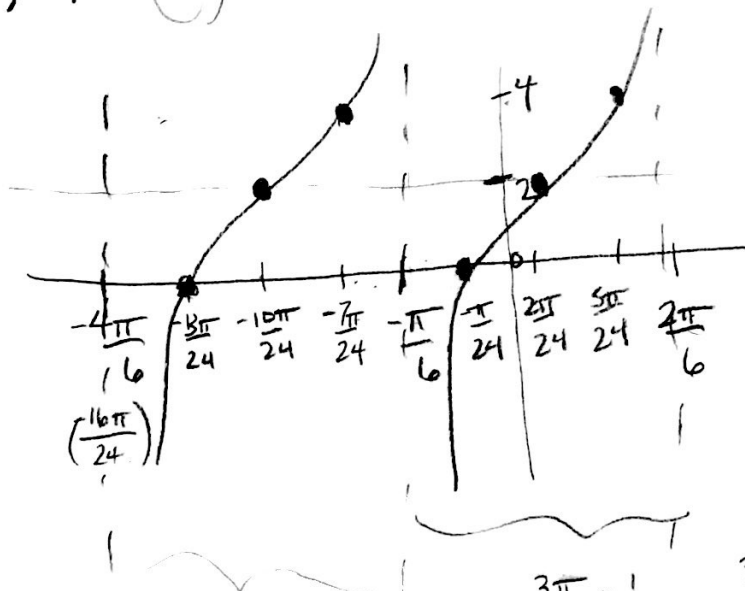
$$C = 0$$

$$d = 0$$

$$kp: \frac{2\pi}{12} = \frac{\pi}{6}$$



$$9) \quad y = 2 \tan \left( 2\theta + \frac{5\pi}{6} \right) + 2$$



$$\frac{3\pi}{6} \cdot \frac{1}{4} = \frac{3\pi}{24}$$

$$2\theta + \frac{5\pi}{6} = -\frac{\pi}{2}$$

$$\frac{1}{2} \cdot 2\theta = -\frac{8\pi}{6} \cdot \frac{1}{2}$$

$$\theta = \left( -\frac{2\pi}{3} \right) \left( -\frac{4\pi}{6} \right)$$

$$2\theta + \frac{5\pi}{6} = \frac{\pi}{2}$$

$$\frac{1}{2} \cdot 2\theta = -\frac{2\pi}{6} \cdot \frac{1}{2}$$

$$\theta = \left( -\frac{\pi}{6} \right)$$

$$y = 2 \cos 4\theta - 2$$

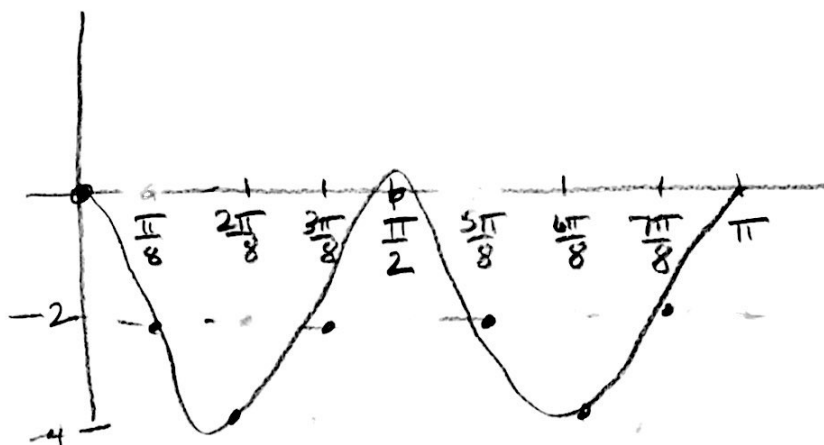
$$a = 2$$

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

$$c = 0$$

$$d = -2$$

$$kp : \frac{\pi}{8}$$



$$11) y = 4 \sin \frac{1}{2} (\theta + \frac{3\pi}{2}) + 2$$

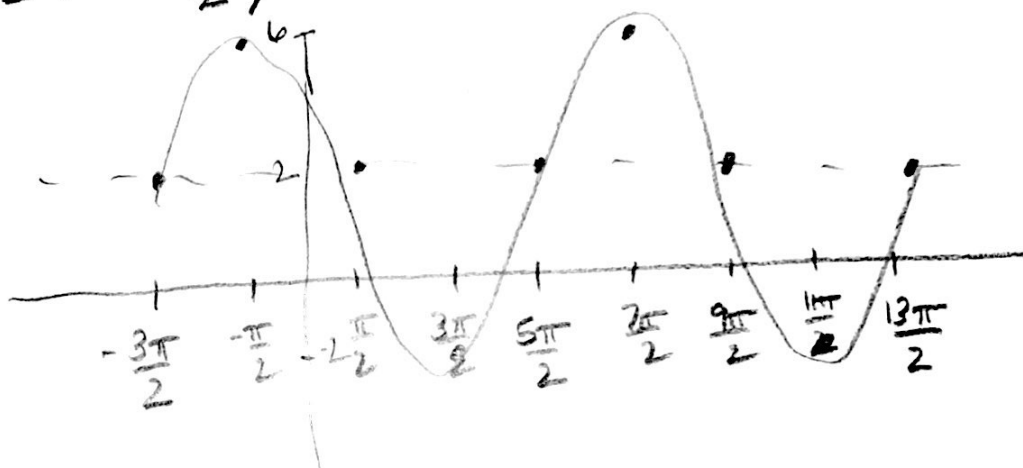
$$a = 4$$

$$b = \frac{2\pi}{\frac{1}{2}} = 4\pi \leftarrow \frac{8\pi}{2}$$

$$c = -\frac{3\pi}{2}$$

$$d = 2$$

$$kp : \frac{4\pi}{4} = \pi \leftarrow \frac{2\pi}{2}$$



$$12) y = 2 \sin 3(\theta + \frac{\pi}{18}) - 1$$

$$a = 2$$

$$p = \frac{2\pi}{3} \leftarrow \frac{24\pi}{36}$$

$$c = -\frac{\pi}{18} \leftarrow -\frac{2\pi}{36}$$

$$d = -1 \leftarrow \frac{6\pi}{36}$$

$$Rp : \frac{2\pi}{12} \leftarrow \frac{6\pi}{36}$$

