$b = \frac{2\pi}{\text{period}}$ $b = \frac{360^\circ}{\text{Period}}$

Trig Graphing – WS 3 **Name** Key

Write an equation of the sine function given the following characteristics.

1. amplitude: 5 period: 360° phase shift: 60°

$a = 5$ $b = \frac{360}{360} = 1$ $c = 60^\circ$

$y = a \sin b(\theta - c) + d$

$y = 5 \sin(\theta - 60^\circ)$

2. amplitude: $\frac{2}{3}$ period: π phase shift: $\frac{\pi}{4}$

$a = \frac{2}{3}$ $b = \frac{2\pi}{\pi} = 2$ $c = \frac{\pi}{4}$

$y = a \sin b(x - c) + d$

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

3. amplitude: 17 period: 45° phase shift: –60°

$a = 17$ $b = \frac{360}{45} = 8$ $c = -60^\circ$

$y = a \sin b(\theta - c) + d$

$y = 17 \sin 8(\theta + 60^\circ)$

4. amplitude: $\frac{1}{2}$ period: $\frac{3\pi}{2}$ phase shift: $-\frac{\pi}{4}$

$a = \frac{1}{2}$ $b = \frac{2\pi}{3\pi/2} = 2\pi \cdot \frac{2}{3\pi} = \frac{4}{3}$ $c = -\frac{\pi}{4}$

$y = a \sin b(x - c) + d$

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

5. amplitude: 7 period: 225° phase shift: –90°

$a = 7$ $b = \frac{360}{225} = \frac{8}{5}$ $c = -90^\circ$

$y = a \sin b(\theta - c) + d$

$y = 7 \sin \frac{8}{5}(\theta + 90^\circ)$

Write an equation of the cosine function given the following characteristics.

6. amplitude: $\frac{1}{3}$ period: 180° phase shift: 0

$a = \frac{1}{3}$ $b = \frac{360}{180} = 2$ $c = 0$

$y = a \cos b(\theta - c) + d$

$y = \frac{1}{3} \cos 2\theta$

7. amplitude: 3 period: 180° phase shift: 120°

$a = 3$ $b = \frac{360}{180} = 2$ $c = 120$

$y = a \cos b(\theta - c) + d$

$y = 3 \cos 2(\theta - 120^\circ)$

8. amplitude: 100 period: 630° phase shift: –90°

$a = 100$ $b = \frac{360}{630} = \frac{4}{7}$ $c = -90^\circ$

$y = a \cos b(\theta - c) + d$

$y = 100 \cos \frac{4}{7}(\theta + 90^\circ)$

9. amplitude: $\frac{7}{3}$ period: 150° phase shift: 270°

$a = \frac{7}{3}$ $b = \frac{360}{150} = \frac{12}{5}$ $c = 270^\circ$

$y = a \cos b(\theta - c) + d$

$y = \frac{7}{3} \cos \frac{12}{5}(\theta - 270^\circ)$

10. amplitude: 1 period: $\frac{3\pi}{4}$ phase shift: $-\frac{\pi}{3}$

$a = 1$ $b = \frac{2\pi}{3\pi/4} = 2\pi \cdot \frac{4}{3\pi} = \frac{8}{3}$ $c = -\frac{\pi}{3}$

$y = a \cos b(x - c) + d$

$y = \cos \frac{8}{3}\left(x + \frac{\pi}{3}\right)$