

Name

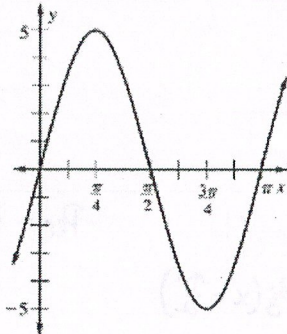
Key

8.3 Graphs of Sine and Cosine Functions Worksheet

Writing Equations of Sine and Cosine Functions

Examine the graph below and determine the amplitude, period, phase shift, and vertical shift of each using **COSINE** as the parent function. Then write an equation of the function.

1.



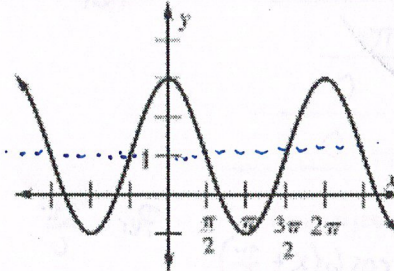
$$\frac{2\pi}{B} = \pi$$

$$B\pi = 2\pi$$

$$B = 2$$

Amplitude: 5Period: π Phase Shift: $\frac{\pi}{4}$ Vertical Shift: 0Function: $y = 5\cos 2(x - \frac{\pi}{4})$

2.



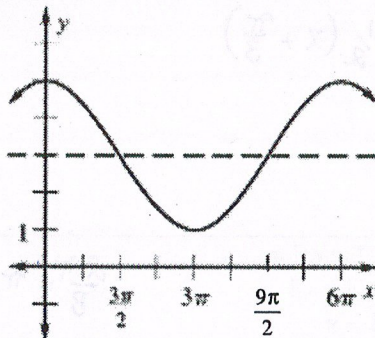
$$\frac{2\pi}{B} = 2\pi$$

$$B = 1$$

Amplitude: 2Period: 2π Phase Shift: 0Vertical Shift: 1Function: $y = 2\cos x + 1$

Examine the graph below and determine the amplitude, period, phase shift, and vertical shift of each using **SINE** as the parent function. Then write an equation of the function.

3.



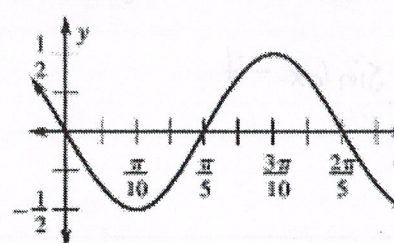
$$\frac{2\pi}{B} = 6\pi$$

$$6\pi B = 2\pi$$

$$B = \frac{1}{3}$$

Amplitude: 2Period: 6π Phase Shift: $\frac{9}{2}\pi$ Vertical Shift: 3Function: $y = 2\sin \frac{1}{3}(x - \frac{9}{2}\pi) + 3$

4.



$$\frac{2\pi}{B} = \frac{2\pi}{5}$$

$$32\pi = 10\pi$$

$$B = 5$$

Amplitude: $\frac{1}{2}$ Period: $\frac{2}{5}\pi$ Phase Shift: $\frac{\pi}{5}$ Vertical Shift: 0Function: $y = \frac{1}{2}\sin 5(x - \frac{\pi}{5})$

Identify the amplitude, period, phase shift and vertical shift of the following trig functions.

5. $y = -10 \cos\left(\frac{x}{6}\right)$ $\text{Per} = \frac{2\pi}{B}$ $= \frac{2\pi}{\frac{1}{6}}$ $= 12\pi$ Amplitude: <u>10</u> Period: <u>12π</u> Phase Shift: <u>0</u> Vertical Shift: <u>0</u>	6. $y = 5 - 2 \sin\left(\frac{2x}{3}\right)$ $\text{Per} = \frac{2\pi}{\frac{2}{3}}$ $y = -2 \sin\left(\frac{2x}{3}\right) + 5$ $= 3\pi$ Amplitude: <u>2</u> Period: <u>3π</u> Phase Shift: <u>0</u> Vertical Shift: <u>5</u>
7. $y = 3 \cos(6x + \pi)$ $\text{Per} = \frac{2\pi}{6}$ $y = 3 \cos 6\left(x + \frac{\pi}{6}\right)$ $= \frac{\pi}{3}$ Amplitude: <u>3</u> Period: <u>$\frac{\pi}{3}$</u> Phase Shift: <u>$-\frac{\pi}{6}$</u> Vertical Shift: <u>0</u>	8. $y = -4 \sin\left(\frac{2}{3}x - \frac{\pi}{3}\right)$ $\text{Per} = \frac{2\pi}{\frac{2}{3}}$ $y = -4 \sin \frac{2}{3}\left(x - \frac{\pi}{2}\right)$ Amplitude: <u>4</u> Period: <u>3π</u> Phase Shift: <u>$\frac{\pi}{2}$</u> Vertical Shift: <u>0</u>

Given the following information about each trig function, write a possible equation for each.

9. Sine Function $\text{Per} = \frac{2\pi}{B}$ amplitude = $\frac{1}{2}$ $\frac{\pi}{3} = \frac{2\pi}{B}$ period = $\frac{\pi}{3}$ $\pi B = 6\pi$ vertical shift = -4 $B = 6$ $y = \frac{1}{2} \sin 6x - 4$	10. Sine Function $\frac{2\pi}{B} = 4\pi$ amplitude = 7 $4\pi B = 2\pi$ period = 4π $B = \frac{1}{2}$ phase shift = $-\frac{\pi}{3}$ $y = 7 \sin \frac{1}{2}\left(x + \frac{\pi}{3}\right)$
11. Cosine Function $\frac{2\pi}{B} = 2\pi$ amplitude = 1 $B = 1$ period = 2π phase shift = $\frac{5\pi}{6}$ vertical shift = 3 $y = \cos\left(x - \frac{5\pi}{6}\right) + 3$	12. Cosine Function $\frac{2\pi}{B} = \pi$ amplitude = 3 $B\pi = 2\pi$ period = π $B = 2$ phase shift = $-\pi$ vertical shift = -1.5 $y = 3 \cos 2\left(x + \pi\right) - 1.5$