

|     |  |  |   |                     |
|-----|--|--|---|---------------------|
| 9.  | Amplitude = $\frac{1}{2}$                      | Period = $\pi$   | Phase Shift = 0                                       | Vertical Shift = 0  |
|     | $\frac{2\pi}{b} = \pi$<br>$b = 2$              | $0 = -\frac{c}{2}$<br>$c = 0$                            | $y = 0 \pm \frac{1}{2} \cos(2x + 0)$                  |                     |
| 10. | Amplitude = 5                                  | Period = 3   | Phase Shift = -1                                      | Vertical Shift = -4 |
|     | $\frac{2\pi}{b} = 3$<br>$b = \frac{2\pi}{3}$   | $-\frac{c}{\frac{2\pi}{3}} = -1$<br>$c = \frac{2\pi}{3}$ | $y = -4 \pm 5 \cos(\frac{2\pi}{3}x + \frac{2\pi}{3})$ |                     |
| 11. | Amplitude = 1                                  | Period = $\frac{\pi}{4}$                                 | Phase Shift = 1                                       | Vertical Shift = -2 |
|     | $\frac{2\pi}{b} = \frac{\pi}{4}$<br>$b = 8\pi$ | $-\frac{c}{8\pi} = 1$<br>$c = -8\pi$                     | $y = -2 \pm \cos(8x - 8)$                             |                     |

State the amplitude, period, phase shift, asymptotes and vertical shift for each of the following.

12.  $y = \frac{1}{2} \sec(\frac{x}{4})$

|  |                |                |                   |             |
|--|----------------|----------------|-------------------|-------------|
| Amplitude: none  | Period: $8\pi$ | Phase Shift: 0 | Vertical Shift: 0 | Asymptotes: |
| Key Points: $(0, \frac{1}{2})$ $(2\pi, 0)$ $(4\pi, \frac{1}{2})$ $(6\pi, 0)$ $(8\pi, \frac{1}{2})$ | Graph:         |                |                   |             |

13.  $y = 1 + 2\csc(\pi x - 3)$

|  |           |                              |                   |   |
|--|-----------|------------------------------|-------------------|---|
| Amplitude: none  | Period: 2 | Phase Shift: $\frac{3}{\pi}$ | Vertical Shift: 1 | Asymptotes: $x = \frac{3}{\pi}$ , $x = \frac{3}{\pi} + 1$ , $x = \frac{3}{\pi} + 2$ |
| Key Points: $(\frac{3}{\pi}, 1)$ $(\frac{3}{\pi} + \frac{1}{2}, 3)$ $(\frac{3}{\pi} + 1, 1)$<br>$(\frac{3}{\pi} + \frac{3}{2}, -1)$ $(\frac{3}{\pi} + 2, 3)$ | Graph:    |                              |                   |   |

14.  $y = 3 - 2\sec(\frac{\pi}{2}x + \frac{\pi}{4})$

|  |           |                             |                   |   |
|--|-----------|-----------------------------|-------------------|---|
| Amplitude: none  | Period: 4 | Phase Shift: $-\frac{1}{2}$ | Vertical Shift: 3 | Asymptotes: $x = \frac{1}{2}$ , $x = \frac{5}{2}$ |
| Key Points: $(-\frac{1}{2}, 1)$ $(\frac{3}{2}, 5)$ $(\frac{7}{2}, 1)$<br>$(\frac{5}{2}, 3)$ $(\frac{9}{2}, 3)$ | Graph:    |                             |                   |   |

Write the equation of the trigonometric function for the given graph.

|  |  |
|--|--|
| 15.  | 16.  |
| $A = 2$ $P = \frac{\pi}{2}$ $PS = \frac{\pi}{4}$ $VS = 3$<br>$y = 3 - 2\sin(4x - \pi)$                     | $y = \frac{1}{4} \cos(x + \frac{2\pi}{3})$ |
| $\frac{2\pi}{b} = \frac{\pi}{2}$ $\pi b = 4\pi$ $\frac{c}{4} = \frac{\pi}{4}$<br>$b = 4$ $b = 4$ $c = \pi$ |  |