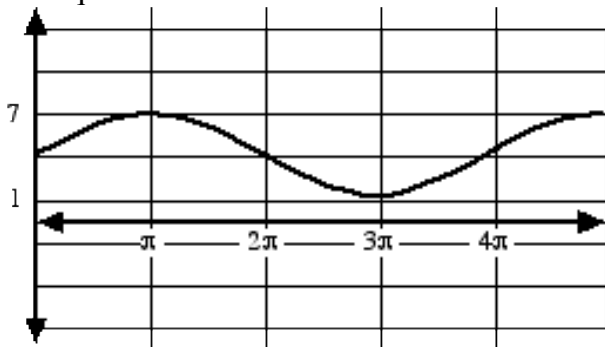


# PC 12 LG 7 Worksheet (Trig Graphs)

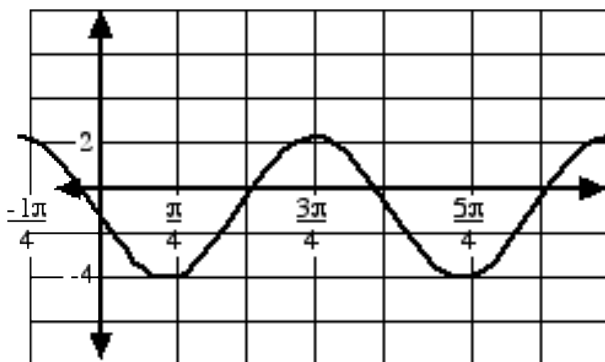
1. If  $y = -5\sin\left(2x + \frac{\pi}{8}\right) - 7$ , find the:
- a) amplitude
  - b) vertical displacement
  - c) period
  - d. phase shift
  - e. max value of y
  - f) min value of y
2. If  $y = 3\cos(6\pi x - 12) + 14$ , find the:
- a) amplitude
  - b) vertical displacement
  - c) period
  - d. phase shift
  - e. max value of y
  - f) min value of y

3. If  $y = -4\cos(2x - 8) - 10$ , find the:
- a) domain of the function.
  - b) range of the function.

4. Given the sinusoidal graph below, write the equation of the function as a:



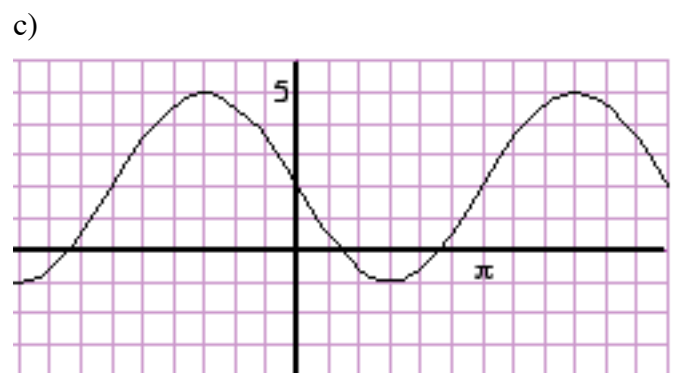
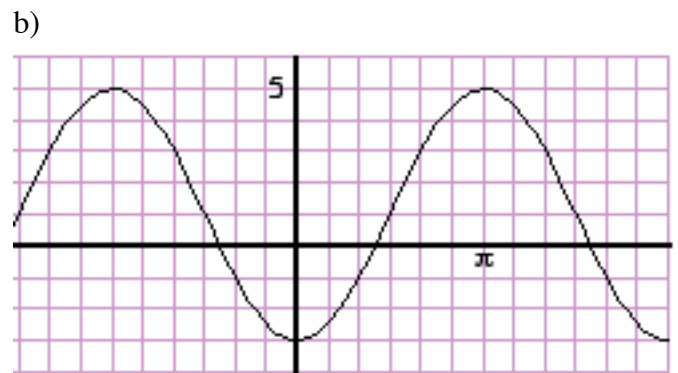
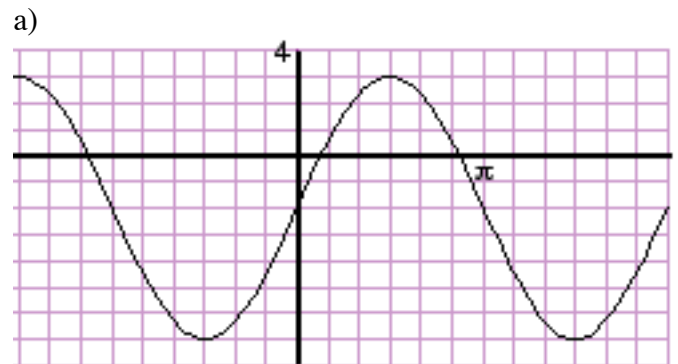
- a) Sine function
  - b) Cosine function
5. Given the sinusoidal graph below, write the equation of the function as a:



- a) Sine function
- b) Cosine function

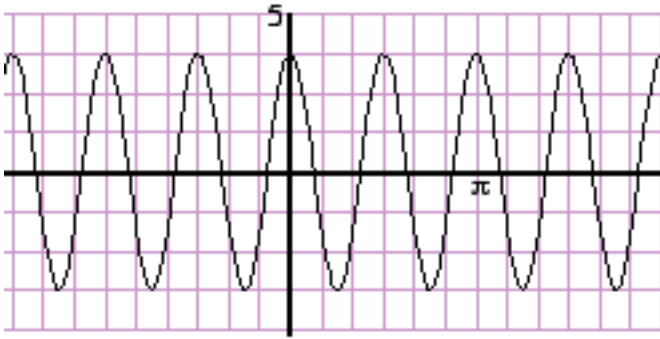
6. a) Find the maximum value of  $f(x) = a\sin x + d$  where  $a > 0, d > 0$ .
- b) Determine the period of  $y = 8\cos\left(\frac{2\pi}{15}x\right) + 8$ .
- c) Determine the range of  $y = 4\cos x - 2$ .
- d) Determine the range of  $y = -2\sin 3x + 4$ .
- e) Determine the period of  $f(x) = \frac{-1}{2}\sin\frac{x}{3}$ .
- f) Find the range of  $f(x) = b\cos ax - 2b$  where  $a > 0, b > 0$ .

7. Given the graphs below, determine an equation of the function. Use your graphing calculator to check.

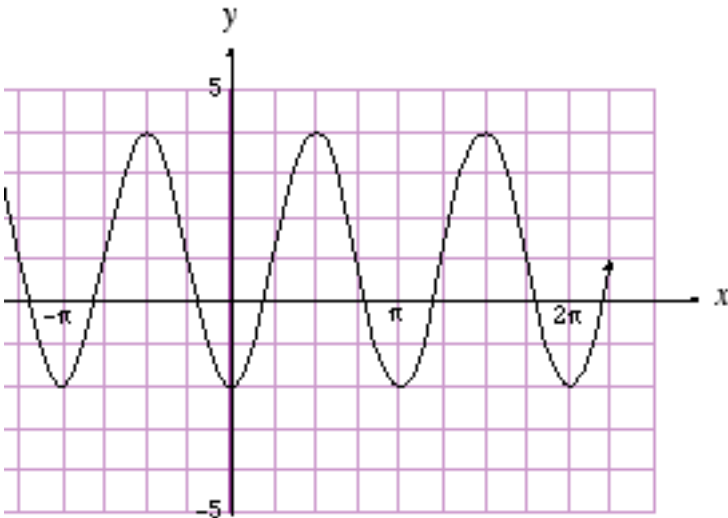


# PC 12 LG 7 Worksheet (Trig Graphs)

d)



8. The graph below is a function that can be written in the form:  $y = a\sin b(x - c) + d$ . Determine the values of  $a, b, c, d$ . Use your graphing calculator to verify your result.



9. At a seaport, the depth of the water  $h$  in metres at time  $t = 1$  hour during a certain day is given by this formula

$$h = 2.4\cos \frac{2\pi}{12.4}(t - 5) + 4.2$$

Assume that when  $t = 0$ , it is midnight. Use your graphing calculator to determine how long after midnight (the first two times) that the water is 5 m deep.

## Answer Key

- 5
    - 7
    - $\pi$
    - $\frac{\pi}{16}$  left
    - 2
    - 12
  - 3
    - 14
    - $\frac{1}{3}$
    - $\frac{2}{\pi}$  right
    - 17
    - 11
  - All real #'s
    - $-14 \leq y \leq -6$
  - $y = \sin \frac{1}{2}(x - 0) + 2$
    - $y = \cos \frac{1}{2}(x - \pi) + 2$
  - $y = 3\sin 2(x - \frac{\pi}{2}) - 1$
    - $y = 3\cos 2(x + \frac{\pi}{4}) - 1$
  - $a + d$
    - 15
    - $-6 \leq y \leq 2$
    - $2 \leq y \leq 6$
    - $6\pi$
    - $-3b \leq y \leq -b$
- note:** *there are many different possibilities for the answers to questions 7 and 8.*
- $y = 5\sin x - 2$
    - $y = -4\cos x + 1$
    - $y = -3\sin x + 2$
    - $y = 3\cos 4x$
  - $a = 3, b = 2, c = \frac{\pi}{4}, d = 1$   
 or  
 $a = -3, b = 2, c = \frac{-\pi}{4}, d = 1$
  - 2.57 hrs, 7.43 hrs