Name __Solution Key__

Score _____

1. Given $g(x) = 2 + 3 \cos\left[\dfrac{\pi}{8}(x+1)\right]$, which of the following statements is (not true?)

a) The amplitude of $g(x)$ is 3.

b) The period of $g(x)$ is 8.

c) The phase shift is -1.

d) The vertical shift is 2.

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2. Which of the following functions has both an amplitude of 2 and a period of 4π?
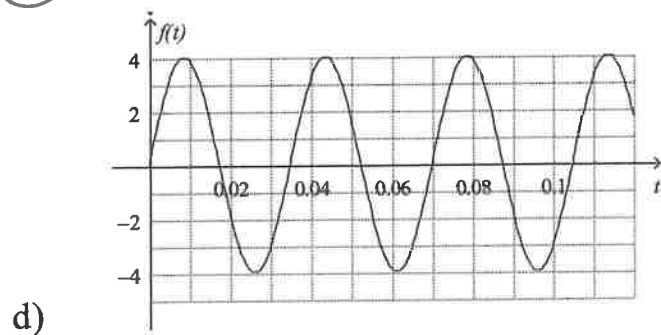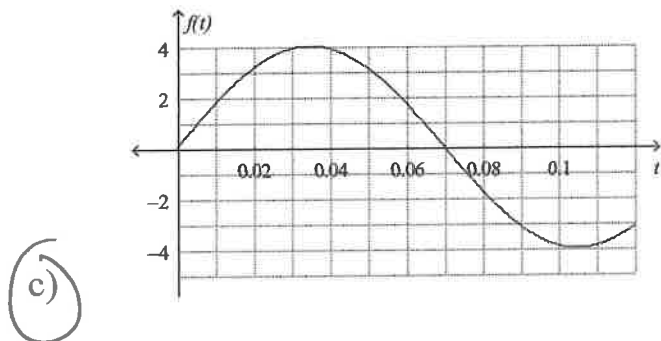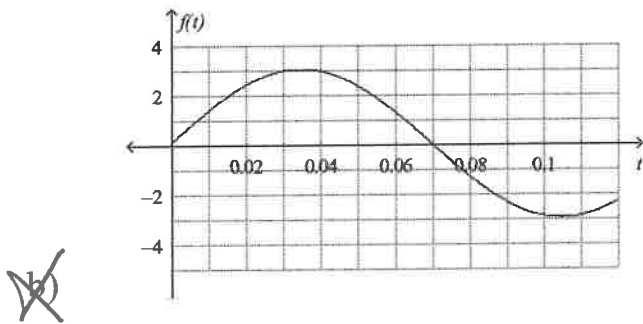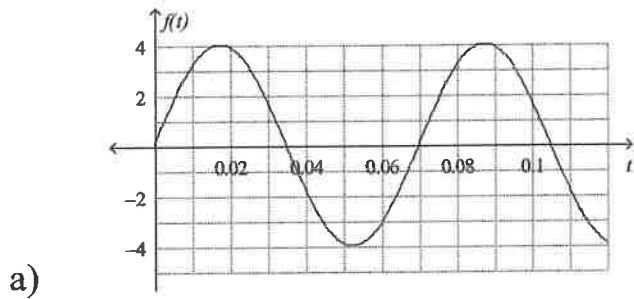
a) $y = 2\cos\left[\dfrac{1}{4}(x+0)\right]$

b) $y = 2\sin\left[4(x+\pi)\right]$

c) $y = -3 - 2\tan\left[\dfrac{1}{4}(x-\pi)\right]$

d) $y = 2 + \sec\left[\dfrac{1}{2}(x-4\pi)\right]$

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3.   Which of the following would be the sketch of a sound wave has a period of 0.14 seconds and an amplitude of 4 units?

a)

b)

c)

d)

4. The depth of water at a dock is determined by tidal flow, which follows a sinusoidal pattern. Six hours after you start timing, you notice that you have reached high tide, where the water is 26 feet deep. 8 hours later, you see that the tides have hit their lowest point, and the water is 6 feet deep. What is the amplitude of the variation?

(a)   20

(b)   13

(c)   10

(d)   8

(e)   6
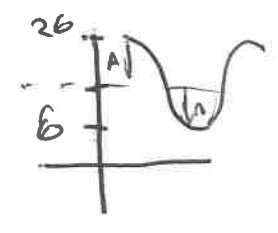
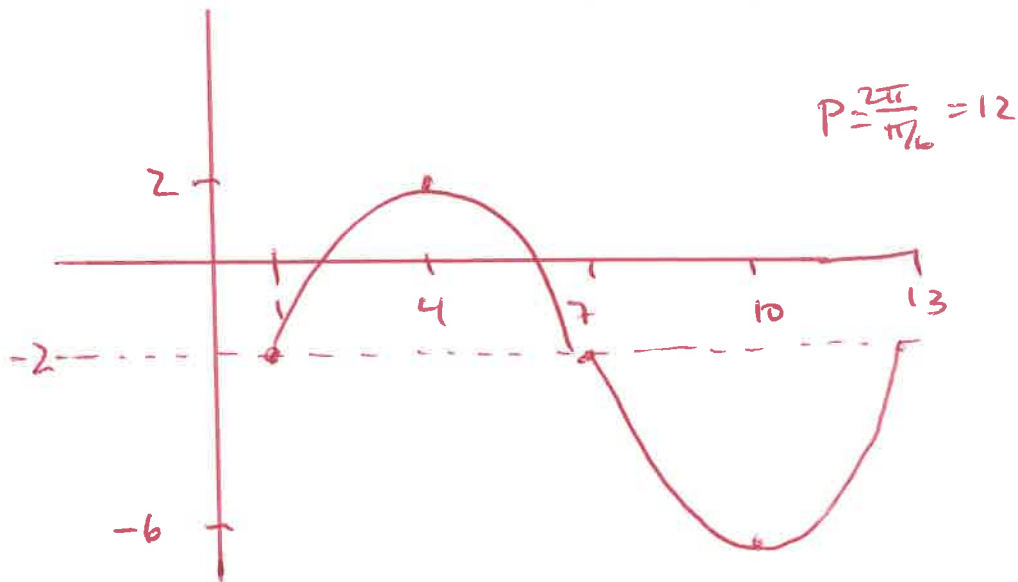5. Which of the following is NOT an equation for this graph
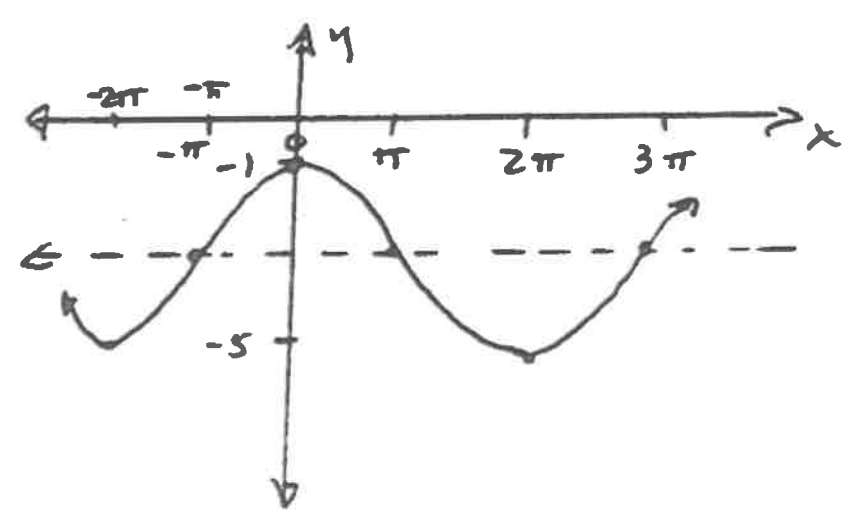
a) $y = -3 + 2\cos\left[\dfrac{1}{2}(x - 2\pi)\right]$

b) $y = -3 + 2\sin\left[\dfrac{1}{2}(x + \pi)\right]$

c) $y = -3 - 2\sin\left[\dfrac{1}{2}(x - \pi)\right]$

d) $y = -3 - 2\cos\left[\dfrac{1}{2}(x - 2\pi)\right]$

PreCalc ACC '22-23
Chapter 2 Test--FR
Calculator required
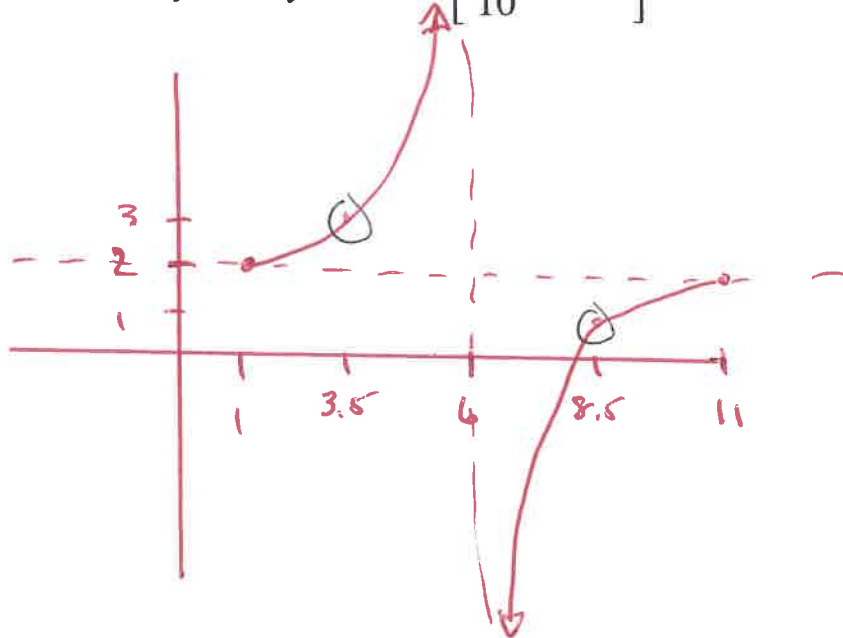Round all answers to 3 decimals

Name___SOLUTION Key___

Score _____

6. Sketch one cycle of $y = -2 + 4\sin\left[\dfrac{\pi}{6}(x-1)\right]$

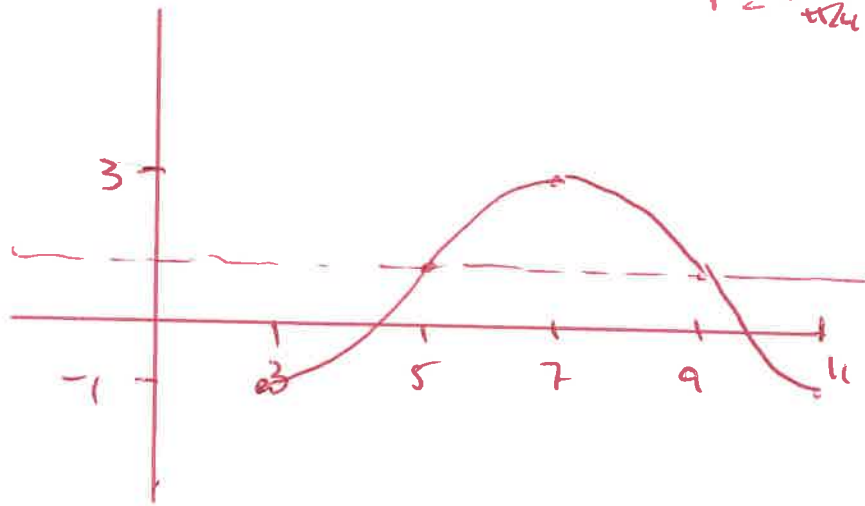$P = \dfrac{2\pi}{\pi/6} = 12$

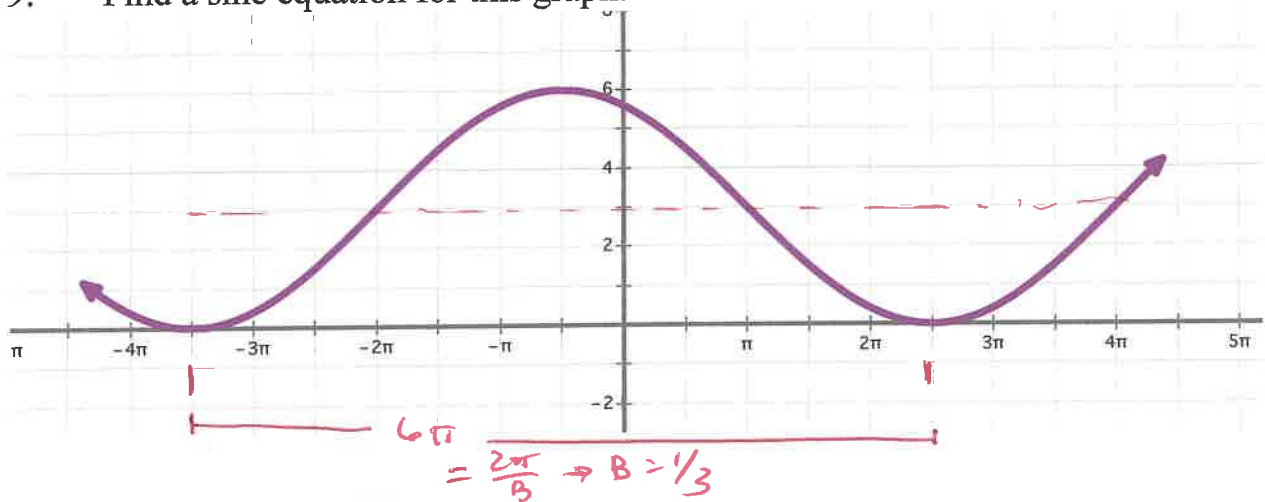7. Sketch one cycle of $y = 2 + \tan\left[\dfrac{\pi}{10}(x-1)\right]$

8. Sketch one cycle of $y = 1 - 2\cos\left[\dfrac{\pi}{4}(x-3)\right]$

$P = \dfrac{2\pi}{\pi/4} = 8$

9. Find a sine equation for this graph:

$6\pi = \dfrac{2\pi}{B} \to B = 1/3$

$y = 3 + 3\sin\dfrac{1}{3}(x + 2\pi)$

or $y = 3 - 3\sin\dfrac{1}{3}(x - \pi)$

10. If $f(x) = 2 - 5\cos\left[\dfrac{\pi}{4}(x-2)\right]$, find the first three negative values of x where $f(x) = -1.3$.

$$-1.3 = 2 - 5\cos\frac{\pi}{4}(x-2)$$

$$-3.3 = -5\cos\frac{\pi}{4}(x-2)$$

$$.66 = \cos\frac{\pi}{4}(x-2)$$

$$\left.\begin{array}{l} .850 \pm 2\pi n \\ -.850 \pm 2\pi n \end{array}\right\} = \frac{\pi}{4}(x-2)$$

$$\left.\begin{array}{l} 1.082 \pm 8n \\ -1.082 \pm 8n \end{array}\right\} = x-2$$

$$\left.\begin{array}{l} 3.082 \pm 8n \\ 0.918 \pm 8n \end{array}\right\} = x$$

$$x = -4.918, \ -7.082, \ -12.918$$

11.   Solano County is also a leader in the California for solar production. The average daily incident shortwave solar energy (as measured in per square meter of ground) varies sinusoidal with time variation over the course of the year. The average solar energy is at a maximum of 8.5 kWh on June 26 ($t = 177$). A minimum of 2.1 kWh is reached on December 26 ($t = 360$).

a.   Sketch the graph of this sinusoidal function.
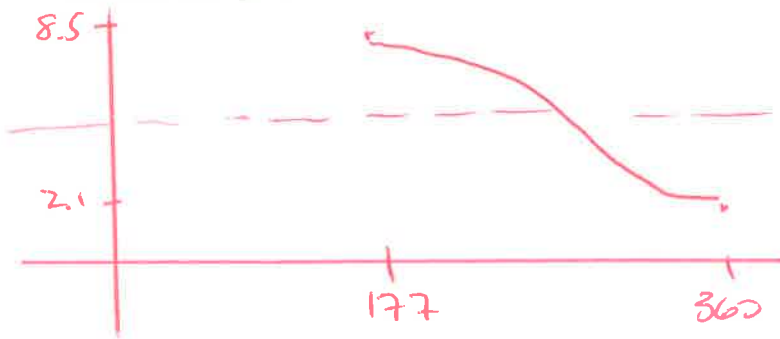
b.   Write the particular equation expressing the daily average solar energy.

$$P = 5.3 + 3.2 \cos \frac{\pi}{183} (t - 177)$$

c.   What is the daily average solar energy on $t = 17$? How about on $t = 200$?

$$P(17) = 2.346 \qquad P(200) = 8.254$$

d.   Find is the two **dates** during the year that the daily average solar energy is 7.2 kWh.

$$7.2 = 5.3 + 32 \cos \frac{\pi}{183} (t - 177)$$

$$.594 = \cos \frac{\pi}{183} (t - 177)$$

$$\pm .935 \pm 2\pi n = \frac{\pi}{183} (t - 177)$$

$$\pm 54.469 \pm 366 n = t - 177$$

$$\left. \begin{array}{l} 231.469 \pm 366 n \\ 122.531 \pm 366 n \end{array} \right\} = t$$

$$t = 231.469, \ 122.549$$

~~May~~ 2ND   ~~August~~ ~~July~~ 19