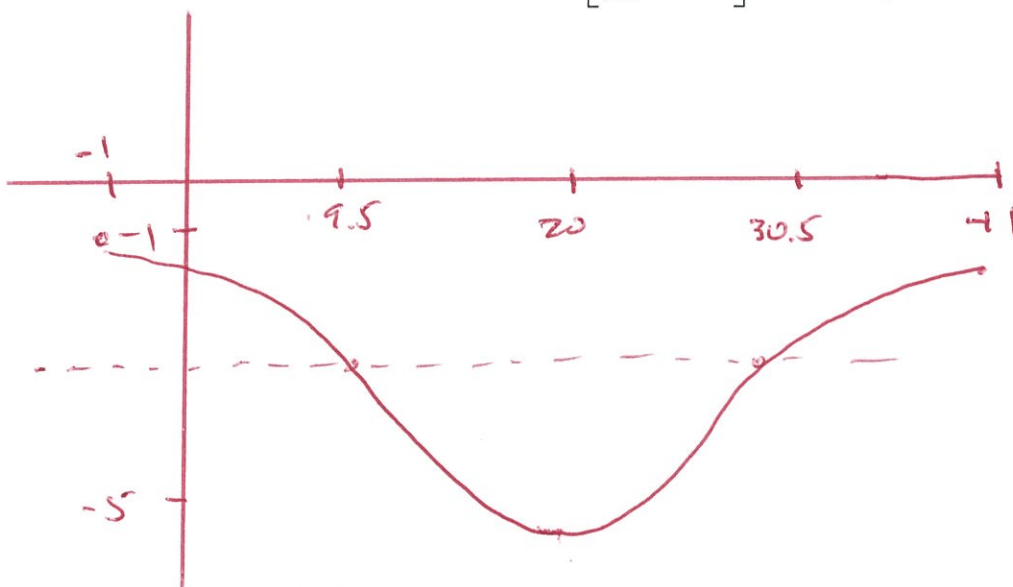


PreCalc ACC '19-20
Chapter 2 Test
Calculator required
Round all answers to 3 decimals

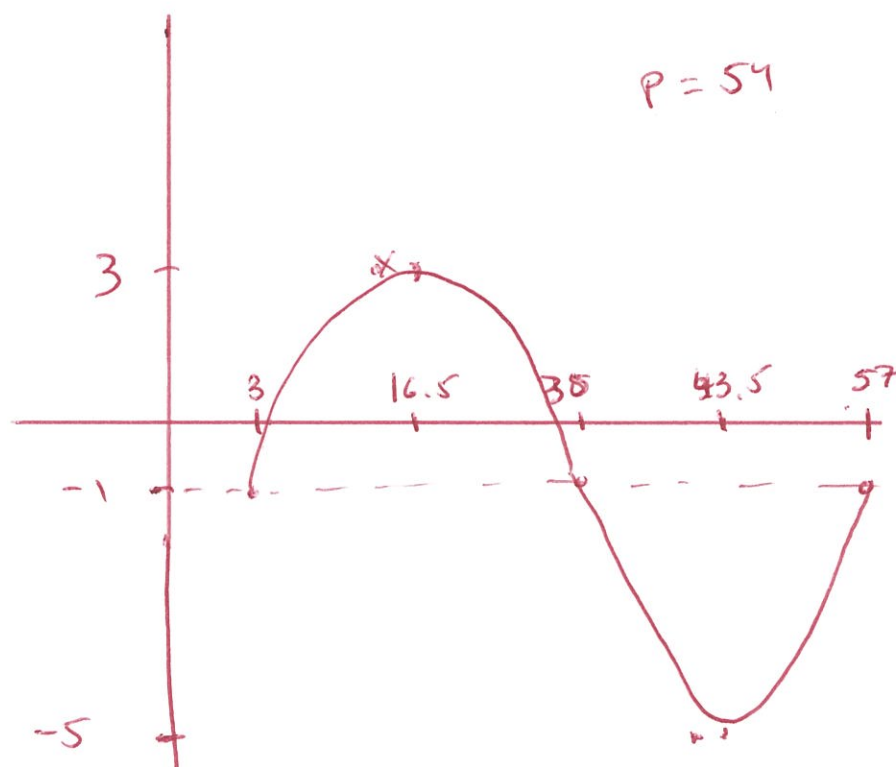
Name SOLUTION KEY

Score _____

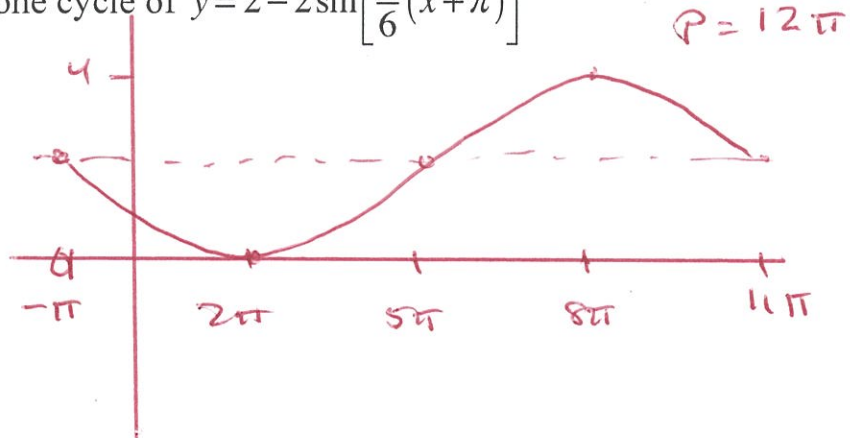
1. Sketch one cycle of $y = -3 + 2 \cos\left[\frac{\pi}{21}(x+1)\right]$ $P=42$



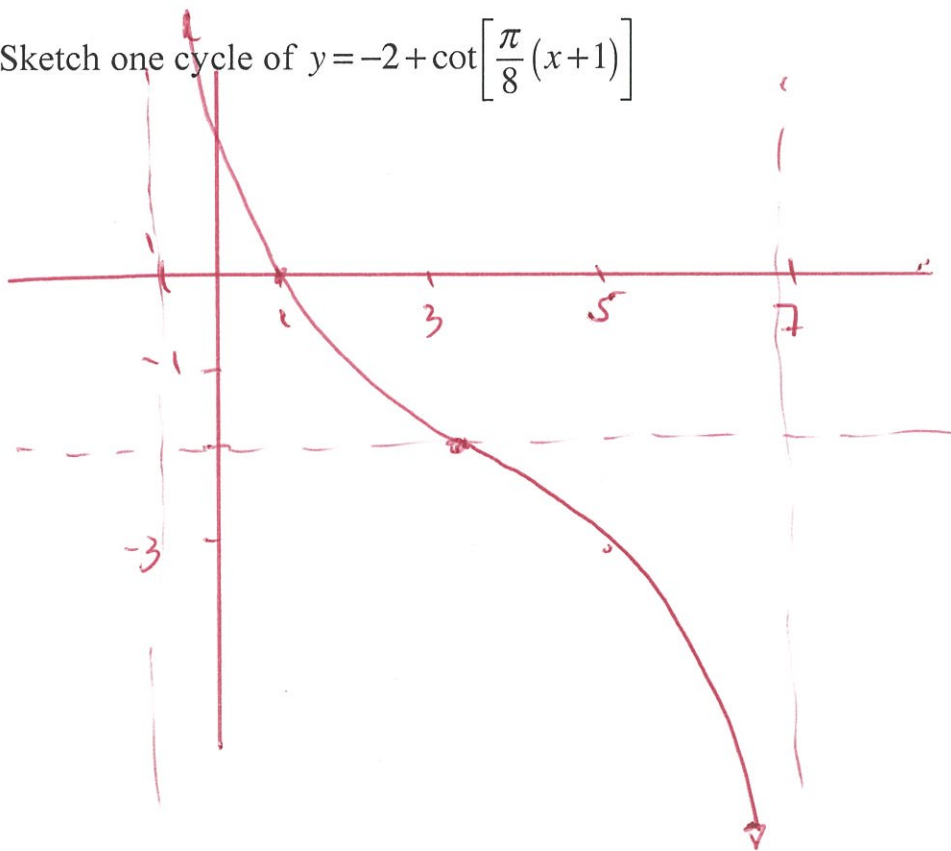
2. Sketch one cycle of $y = -1 + 4 \sin\left[\frac{\pi}{27}(x-3)\right]$



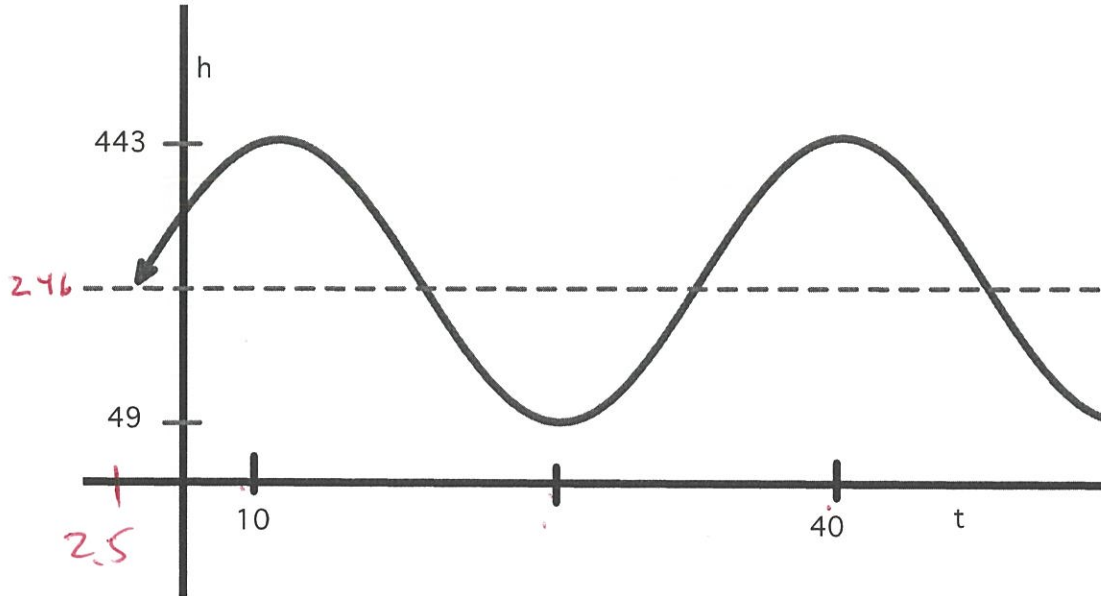
3. Sketch one cycle of $y = 2 - 2 \sin \left[\frac{1}{6} (x + \pi) \right]$



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



5. Find one cosine and one sine equation for this graph:



$$\underline{h = 246 + 197 \cos \frac{\pi}{15} (t - 10)}$$

$$\underline{h = 246 + 197 \sin \frac{\pi}{15} (t - 32.5)}$$

6. If $g(x) = 1 + 4\cos\left[\frac{\pi}{8}(x-13)\right]$, find the first three negative values of x where $g(x) = -1.3$.

$$-1.3 = 1 + 4\cos\frac{\pi}{8}(x-13)$$

$$-2.3 = 4\cos\frac{\pi}{8}(x-13)$$

$$-0.575 = \cos\frac{\pi}{8}(x-13)$$

$$\left. \begin{array}{l} 2.183 \pm 2\pi n \\ -2.183 \pm 2\pi n \end{array} \right\} = \frac{\pi}{8}(x-13)$$

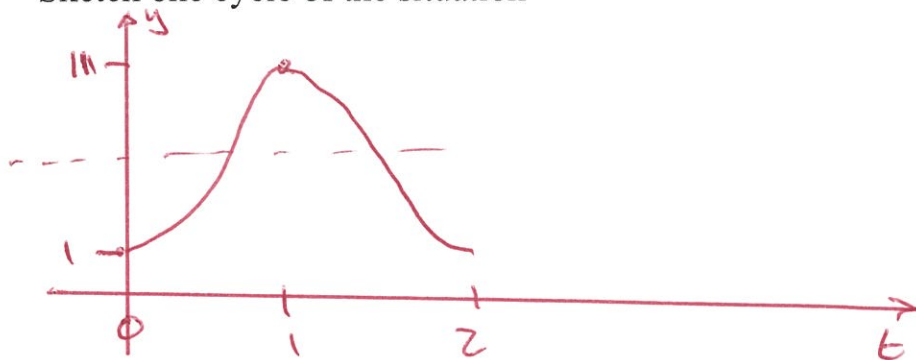
$$\left. \begin{array}{l} 5.560 \pm 16\pi n \\ -5.560 \pm 16\pi n \end{array} \right\} = x-13$$

$$\left. \begin{array}{l} 18.560 \pm 16\pi n \\ 7.440 \pm 16\pi n \end{array} \right\} = x$$

$$x = 7.440, -13.440, -29.560$$

7. A precalc student who is trying to do homework has a little brother who is annoying him by coming annoyingly close to him and saying "I'm not touching you". Rather than swatting away his annoying sibling, he notices that the distance between his brother's fingertip and his body is varying sinusoidally with time. When the student starts timing, the fingertip is 1 cm away from him, the closest that it gets. 1 second later, the fingertip is the furthest away, 11 cm. The brother's annoying antics continue in that fashion.

a. Sketch one cycle of the situation



b. Create an equation that models the distance d in terms of time t .

$$y = 6 + 5 \cos \pi(t-1)$$

c. Find the first 3 times that his fingertip is 2.4 cm away from the student.

$$2.4 = 6 + 5 \cos \pi(t-1)$$

$$\therefore -0.72 = \cos \pi(t-1)$$

$$\left. \begin{array}{l} 2.375 \pm 2\pi n \\ -2.375 \pm 2\pi n \end{array} \right\} = \pi(t-1)$$

$$\left. \begin{array}{l} 0.756 \pm 2n \\ -0.756 \pm 2n \end{array} \right\} = t-1$$

$$t = \begin{cases} 1.756 \pm 2n \\ 0.244 \pm 2n \end{cases}$$

$$t = 0.244, 1.756, 2.244$$