

1. Given $g(x) = 2 + 3 \tan \left[\frac{\pi}{8}(x+1) \right]$, which of the following statements is true?

- ~~I.~~ The amplitude of $g(x)$ is 2. $A = 3$
II. The period of $g(x)$ is 8.
~~III.~~ The phase shift is 1. $h = -1$

- (a) I only (b) II only (c) III only
(d) I and II only (e) II and III

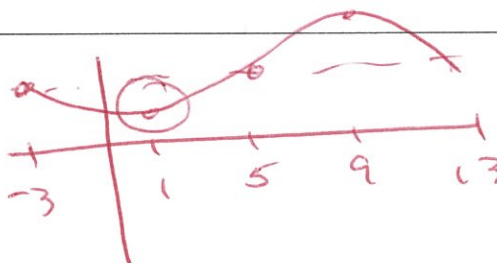
2. On the graph of $y = -\csc x$, as x increases on $x \in [0, \pi]$, the function y

- (a) decreases (b) is constant (c) increases
(d) decreases, then increases (e) increases, then decreases



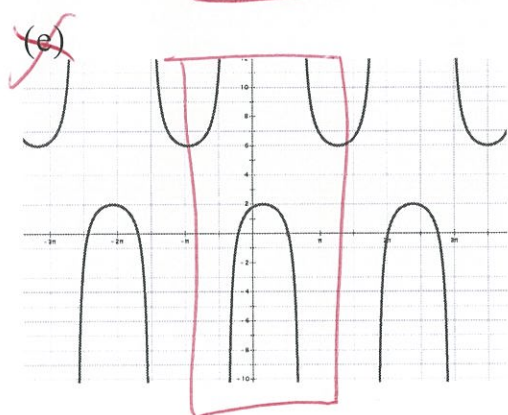
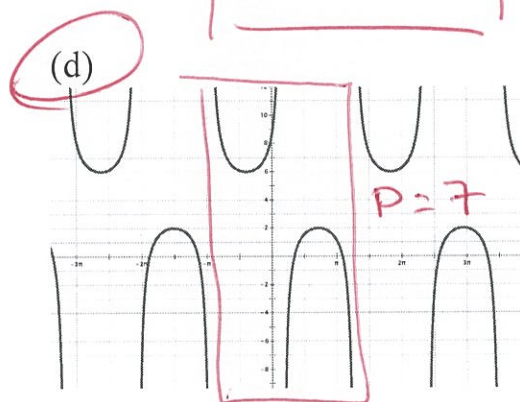
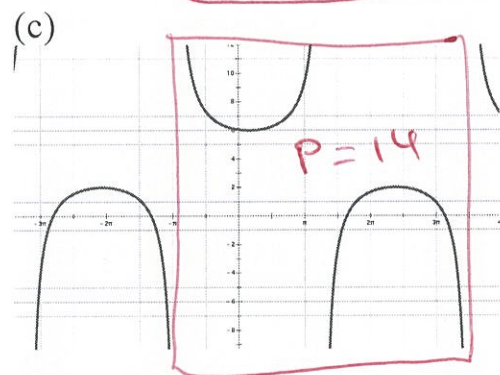
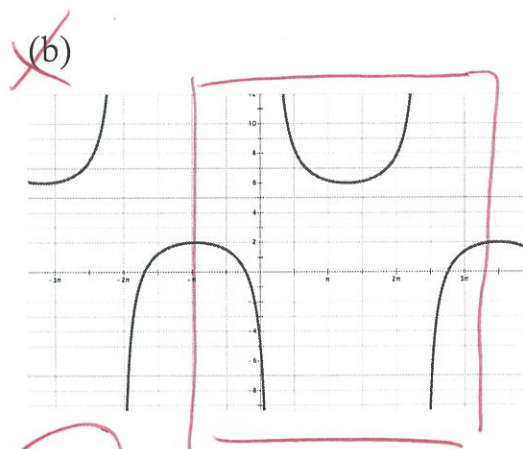
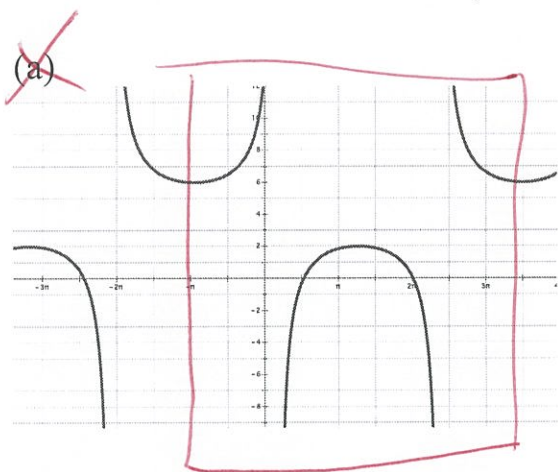
3. What is the smallest positive value where $y = 3 - 2 \sin \left[\frac{\pi}{8}(x+3) \right]$ has a point at a minimum?

- (a) 1 (b) 5 (c) 9 (d) 13 (e) 17

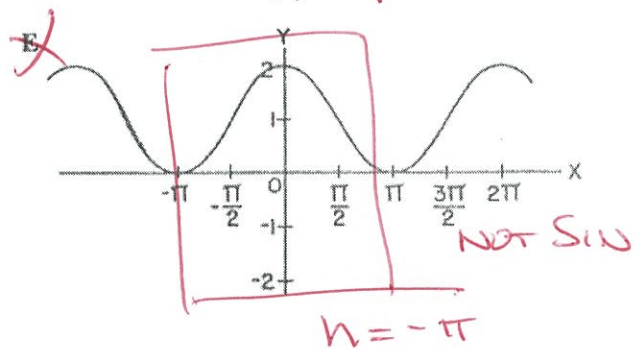
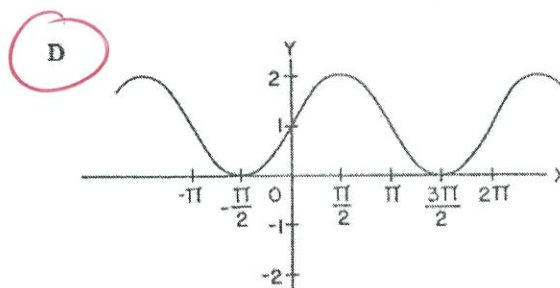
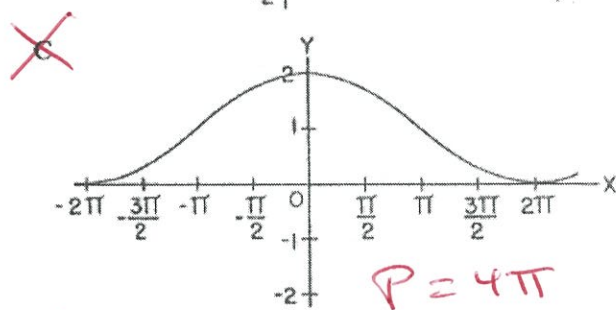
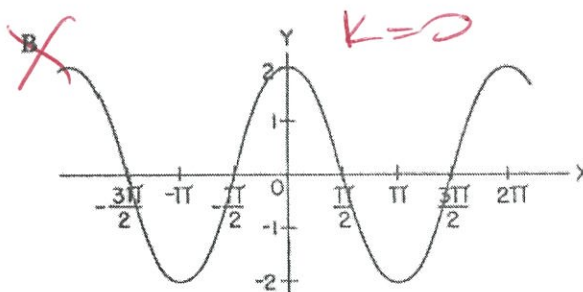
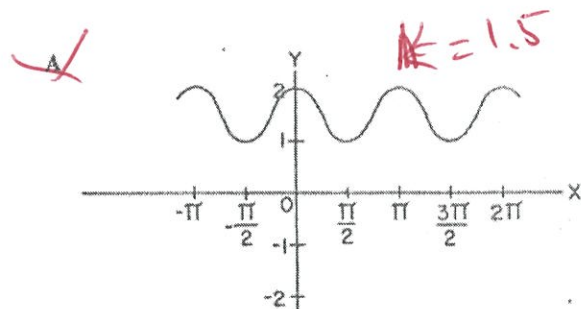


4. Which of the following is the graph of $y = 4 + 2 \csc\left(\frac{2\pi}{7}(x+3)\right)$? (Note: The marks on the x -axis are at every π units.)

$$h = -3$$



5. Which of the following is the graph of $y = 1 - \sin(x + \pi)$?



(a) A (b) B (c) C

(d) D

(e) E

Honors PreCalc '17-18

Chapter 2 Test--FR

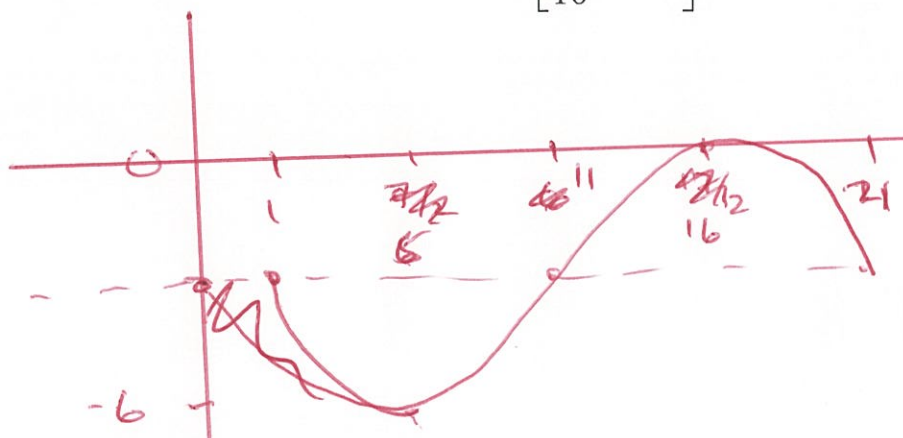
Calculator required

Round all answers to 3 decimals

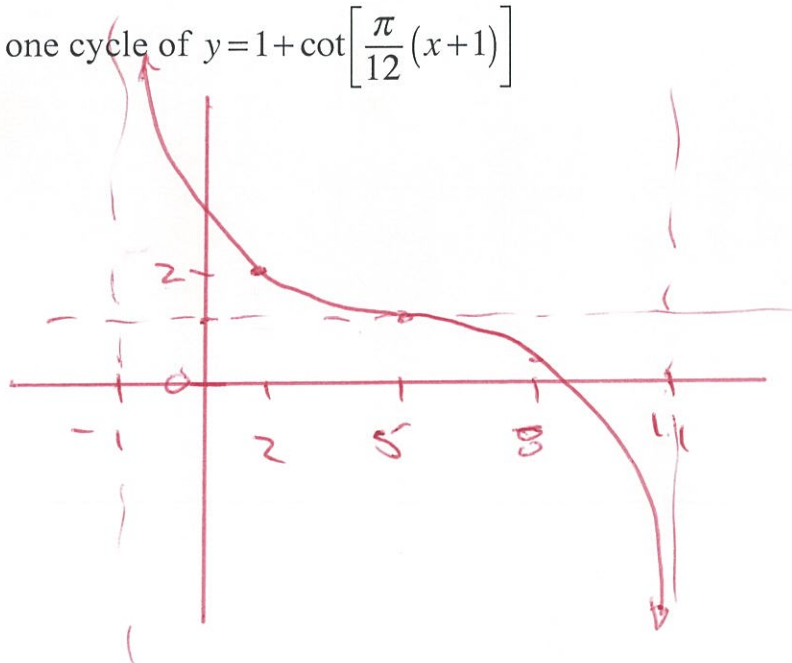
Name SOUTON Key

Score _____

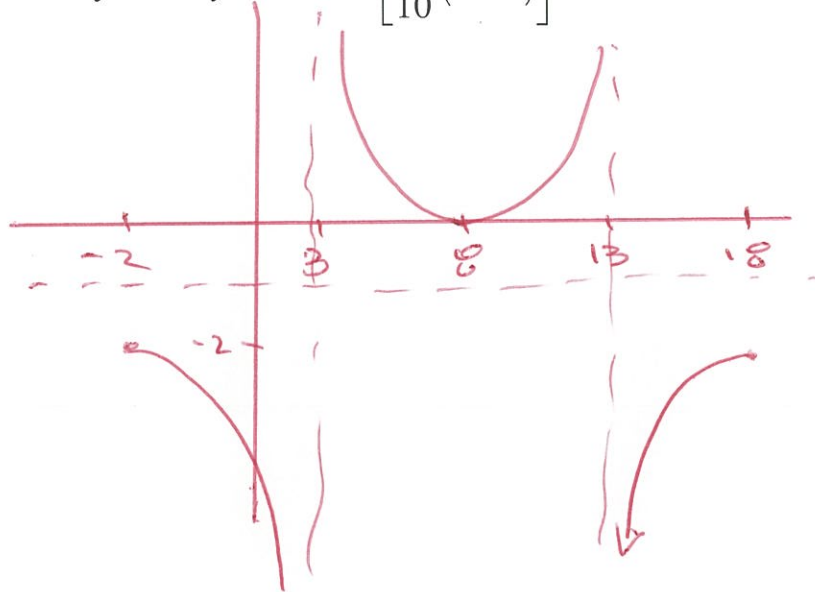
6. Sketch one cycle of $y = -3 - 3\sin\left[\frac{\pi}{10}(x-1)\right]$



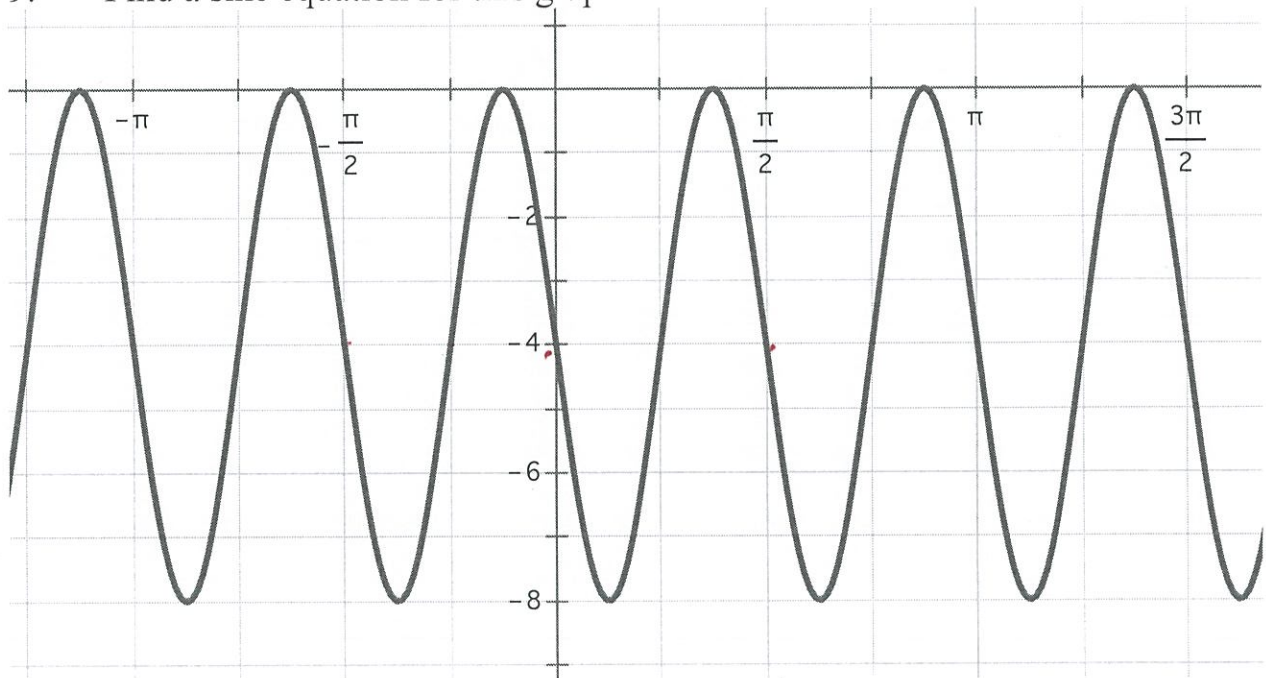
7. Sketch one cycle of $y = 1 + \cot\left[\frac{\pi}{12}(x+1)\right]$



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



9. Find a sine equation for this graph:



$$y = -4 + 4 \sin 4\left(x + \frac{\pi}{4}\right)$$

OR $y = -4 - 4 \sin(4x)$

10. If $H(x) = -1 - 3\cos\left[\frac{\pi}{10}(x+2)\right]$, find the first three negative values of x where $H(x) = 1.3$.

$$1.3 = -1 - 3\cos\frac{\pi}{10}(x+2)$$

$$2.3 = -3\cos\frac{\pi}{10}(x+2)$$

$$-0.767 = \cos\frac{\pi}{10}(x+2)$$

$$\left. \begin{array}{l} 2.444 \pm 2\pi n \\ -2.444 \pm 2\pi n \end{array} \right\} = \frac{\pi}{10}(x+2)$$

$$\left. \begin{array}{l} 7.781 \pm 20n \\ -7.781 \pm 20n \end{array} \right\} = x+2$$

$$x = \begin{cases} -9.781 \pm 20n \\ +5.781 \pm 20n \end{cases}$$

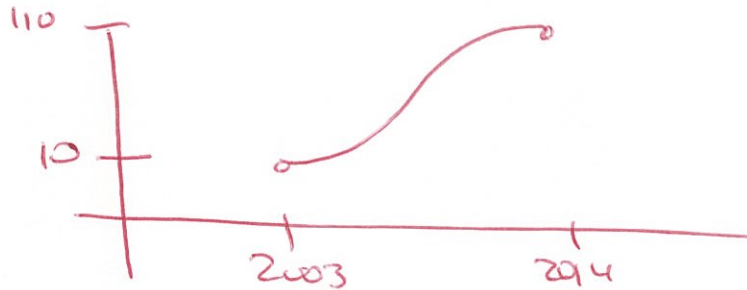
~~$$x = 9.781, 14.219, 29.781$$~~

~~$$x = -5.781, -10.219, -25.781$$~~

$$x = -9.781, -14.219, -29.781$$

11. Astronomers have noticed that the number of visible sunspots varies sinusoidally with time. In 2003, there were a minimum of 10 sunspots and 11 years later the sunspots reached a maximum of 110.

a. Sketch the graph of this sinusoidal function



b. Write the particular equation expressing the number of visible sunspot over time.

$$y = 60 - 50 \cos \frac{\pi}{11} (t - 2003) \text{ OR } y = 60 + 50 \cos \frac{\pi}{11} (t - 2014)$$

c. Predict the number of sunspot that will be visible in 2017.

$$y(2017) \approx 92.74 \text{ BUT YOU CANNOT HAVE "PART OF A SPOT" } \therefore \boxed{93}$$

d. How many years after 2003 did the amount of visible sunspot first reach 100.

$$100 = 60 + 50 \cos \frac{\pi}{11} (t - 2014)$$

$$0.8 = \cos \frac{\pi}{11} (t - 2014)$$

$$\pm 0.644 \pm 2\pi n = \frac{\pi}{11} (t - 2014)$$

$$\pm 2.253 \pm 2\pi n = t - 2014$$

$$t = \begin{cases} 2016.253 \pm 22n \\ 2013.747 \pm 22n \end{cases}$$

$$\text{How Long} = 2013.747 - 2003 = 10.747$$