

SCORE: \_\_\_\_ / 10 POINTS

# NO CALCULATORS ALLOWED

Sketch two full periods of the graph of  $y = 2 \sec(2\pi x + \pi) + 3$ .  
Label the 3 y-coordinates and 9 x-coordinates discussed in class.

SCORE: \_\_\_\_ / 6 POINTS

$$y = 2 \cos(2\pi x + \pi) + 3$$

$$\text{PERIOD} = \frac{2\pi}{2\pi} = 1 \quad \frac{1}{4} \text{ PERIOD} = \frac{1}{4}$$

$$\text{AMP} = 2$$

$$\text{MID} = 3$$

$$\text{START} = -\frac{\pi}{2\pi} = -\frac{1}{2}$$

DIRECTION  $\sim$

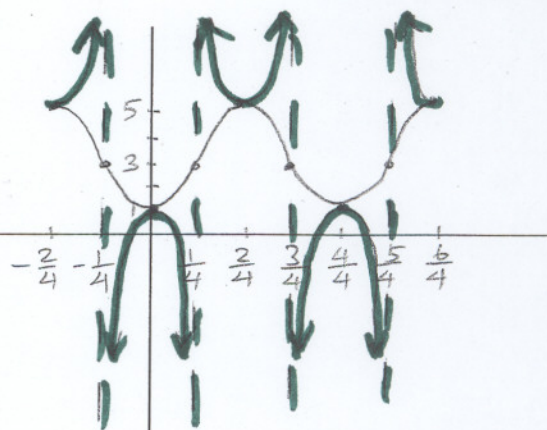
$$-\frac{1}{2} + \frac{1}{4} = -\frac{2}{4} + \frac{1}{4} = -\frac{1}{4}$$

$$-\frac{1}{4} + \frac{1}{4} = \frac{0}{4}$$

$$\frac{1}{4}$$

$$\frac{2}{4}$$

$$\vdots$$



SEC GRAPH  
IN GREEN

CORRECT y-COORDINATES = 1 POINT  
X- = 1  
COS GRAPH = 1  
ASYMPTOTES THROUGH = 1  
MIDLINE  
AND VICE VERSA → COS HILLS = SEC VALLEYS = 1  
COS + SEC TOUCH AT HILLS/VALLEYS = 1

Consider the functions  $y_1 = \sin \pi x - \frac{\sin 3\pi x}{3!}$  and  $y_2 = \sin \pi x - \frac{\sin 3\pi x}{3!} + \frac{\sin 5\pi x}{5!}$ , which approximate a sawtooth wave. Follow the pattern in the terms and find 2 functions  $y_3$  and  $y_4$  which are better approximations.

SCORE: \_\_\_\_ / 2 POINTS

$$y_3 = \sin \pi x - \frac{\sin 3\pi x}{3!} + \frac{\sin 5\pi x}{5!} - \frac{\sin 7\pi x}{7!}$$

$$y_4 = \sin \pi x - \frac{\sin 3\pi x}{3!} + \frac{\sin 5\pi x}{5!} - \frac{\sin 7\pi x}{7!} + \frac{\sin 9\pi x}{9!}$$

**In words**, describe the behavior of the graph of  $y = \cot x$  as  $x$  approaches  $\pi$  [a] from the left and [b] from the right.

NOTE: A graph of the function is **NOT** enough. You must describe it in words.

SCORE: \_\_\_\_ / 2 POINTS

[a] y GOES TOWARDS  $-\infty$   
[b] y GOES TOWARDS  $+\infty$