

Precalculus Honors
Study Guide §§4.3 – 4.5

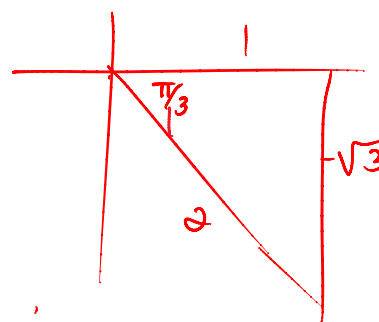
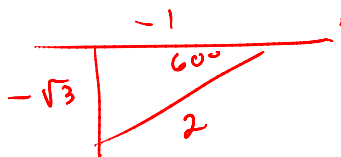
- I. Review your Quiz 4.3 – 4.4!!
II. Non-Calculator Review Questions:

1. Evaluate each expression. Leave in exact form:

a) $\cot\left(\frac{5\pi}{3}\right)$ $-\frac{1}{\sqrt{3}}$

b) $\sin 240^\circ$

$-\frac{\sqrt{3}}{2}$



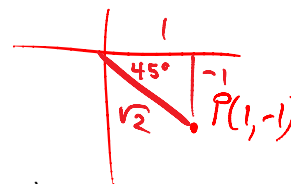
2. Point $P(1, -1)$ is on the terminal side of angle θ .

a) Evaluate $\sec \theta$

$\sqrt{2}$

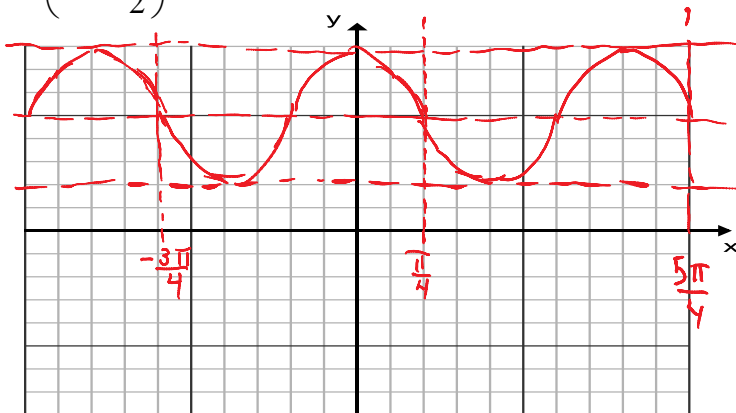
b) Give the smallest positive measure for θ (give your answer in radians)

$-45^\circ + 360^\circ =$ 315°



$y = -3 \sin \left[2 \left(x - \frac{\pi}{4} \right) \right] + 5$

3. Graph $y = -3 \sin \left(2x - \frac{\pi}{2} \right) + 5$



4. Write an equation for the graph shown

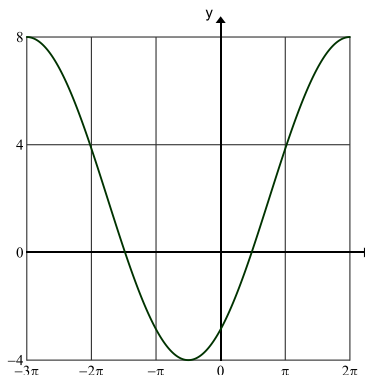
any or equivalent

$$y = 2 + 6 \cos \left[\frac{2}{5} \left(x + \frac{3\pi}{4} \right) - 2\pi \right]$$

$$y = 2 - 6 \cos \left[\frac{2}{5} \left(x + \frac{\pi}{2} \right) \right]$$

$$y = 2 + 6 \sin \left[\frac{2}{5} \left(x - \frac{3\pi}{4} \right) \right]$$

$$y = 2 - 6 \sin \left[\frac{2}{5} \left(x + \frac{7\pi}{4} \right) \right]$$



5. The town of Monotony has a very odd weather pattern: every day's temperatures follow the same pattern, with a high temperature of 80° at 2:00 pm, and a low temperature of 58° at 2:00 am. Let t represent the number of hours since midnight (on some given day) and write a sinusoidal model for the temperature as a function of t .

$$D = 14 \quad (2 \text{ pm})$$

$$\text{Period} = 24$$

$$B = \frac{2\pi}{24} = \frac{\pi}{12}$$

$$C = \frac{80 + 58}{2} = \frac{138}{2}$$

$$= 69^\circ$$

$$A = \frac{80 - 58}{2} = \frac{22}{2} = 11^\circ$$

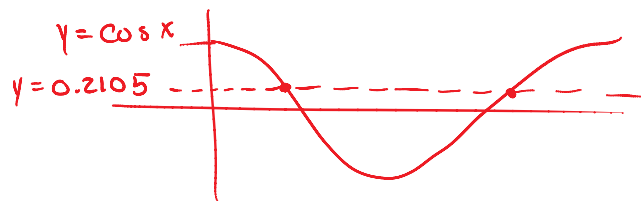
$$y = 69 + 11 \cos \left[\frac{\pi}{12}(t - 14) \right]$$

III. Calculator Review Questions:

6. Solve $\sec x = 4.75$ for $0 \leq x \leq 2\pi$

$$\cos x = \frac{1}{4.75} \approx 0.2105$$

$$x \in \{1.359, 4.925\}$$



7. List 3 angles that are coterminal with $-\frac{2\pi}{3}$ (do not include $-\frac{2\pi}{3}$)

$$\text{Any 3 of: } \dots, -\frac{14\pi}{3}, -\frac{8\pi}{3}, \frac{4\pi}{3}, \frac{10\pi}{3}, \frac{16\pi}{3}, \dots$$

8. Identify the asymptotes of $y = 2 + \cot\left(\frac{x}{2}\right)$

$$y = \cot x \rightarrow \text{asymptotes at } x = k\pi$$

$$\text{horiz stretch b.a.f.o. } 2 \rightarrow$$

$$x = 2k\pi \text{ for any integer } k$$

9. Let $f(x) = 3 - 2\sec(4x)$

$$\dots, x = -4\pi, x = -2\pi, x = 0, x = 2\pi, \dots$$

- a. Identify the period of $f(x)$

$$\frac{2\pi}{4} = \frac{\pi}{2}$$

- b. Identify the domain of $f(x)$

$$\cos(4x) = 0 \text{ when } 4x = \text{odd mult of } \frac{\pi}{2} \rightarrow x \neq \text{odd mult of } \frac{\pi}{8}$$

- c. Identify the range of $f(x)$

$$3 - 2 = 1$$

$$3 + 2 = 5$$

$$x \neq \frac{-3\pi}{8}, \frac{-\pi}{8}, \frac{\pi}{8}, \frac{3\pi}{8}, \frac{5\pi}{8}, \dots$$

$$y \leq 1 \text{ or } y \geq 5$$