

Math 4 - Precalculus
M. Eastman - Spring 2011

Test 3 - ANSWERS

1. $P = \left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

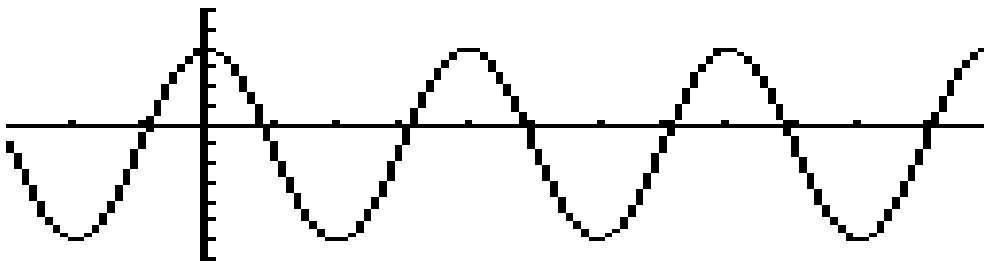
$$\begin{aligned} \sin t &= -\frac{\sqrt{3}}{2} & \cos t &= \frac{1}{2} & \tan t &= -\sqrt{3} \\ \cot t &= -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3} & \sec t &= 2 & \csc t &= -\frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3} \end{aligned}$$

2. $\cos t = -\frac{8}{\sqrt{89}} = -\frac{8\sqrt{89}}{89}$ $\sin t = -\frac{5}{\sqrt{89}} = -\frac{5\sqrt{89}}{89}$
 $\cot t = \frac{8}{5}$ $\sec t = -\frac{\sqrt{89}}{8}$ $\csc t = -\frac{\sqrt{89}}{5}$

3. The angle α is in quadrant *IV*.

$$\begin{aligned} \cos \theta &= \frac{\sqrt{33}}{7} & \tan \theta &= -\frac{4}{\sqrt{33}} & \sec \theta &= \frac{7}{\sqrt{33}} & \csc \theta &= -\frac{7}{4} \\ \cot \theta &= -\frac{\sqrt{33}}{4} & \cos(-\theta) &= \frac{\sqrt{33}}{7} & \sin(-\theta) &= \frac{4}{7} & \tan(-\theta) &= \frac{4}{\sqrt{33}} \end{aligned}$$

4. amplitude = 5 : period = $\frac{2\pi}{3}$: phase shift = $-\frac{\pi}{6}$



5. a. $f(x) = 5 \sin\left(\frac{1}{2}x + \frac{\pi}{3}\right) + 2$ b. $f(x) = 5 \cos\left(\frac{1}{2}x - \frac{\pi}{6}\right) + 2$

6. identities

7. $\beta = 38.8^\circ$ $a = 7 \tan 51.2^\circ \approx 8.7$ $b = \frac{7}{\cos 51.2^\circ} \approx 11.2$

8. $d = \frac{150}{\tan 40^\circ} - \frac{150}{\tan 25^\circ} \approx 142.912 \approx 143$ feet

9. a. $\left\{ \frac{\pi}{12}, \frac{7\pi}{12}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{17\pi}{12}, \frac{23\pi}{12} \right\}$

b. $\left\{ \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3} \right\}$ c. $\left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2} \right\}$