

## Refresher Course Math 1050 and 1060 Practice Problems Set 8 Fall 2007

1.) Convert to radian measure: a.)  $30^\circ$

b.)  $150^\circ$ .

$$a) \frac{\pi}{6}$$

$$b) \frac{5\pi}{6}$$

2.) Convert to degree measure: a.)  $\frac{3\pi}{2}$

b.)  $-\frac{7\pi}{6}$ .

$$a) 270^\circ$$

$$b) -210^\circ \text{ or } 150^\circ$$

3.) Find two coterminal angles (one positive and one negative) for  $\theta = 390^\circ$ .

$$\theta = 30^\circ \text{ and } \theta = -350^\circ$$

4.) Find the complement and supplement of  $\theta = 72^\circ$ .

Complement,  $18^\circ$

Supplement  $108^\circ$

5.) Find

a.) the complement of  $\theta = \frac{\pi}{12}$ .

b.) the supplement of  $\theta = \frac{5\pi}{6}$

$$\frac{5\pi}{12}$$

$$\frac{\pi}{6}$$

c.) a coterminal angle to  $\theta = \frac{17\pi}{6}$ .

$$-\frac{7\pi}{6}$$

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6.) Let  $\theta$  be an acute angle such that  $\sin \theta = 0.6$ . Using trigonometric identities, find the values of

a.)  $\cos \theta$

$$\cos^2 \theta = 1 - \sin^2 \theta = 1 - .36 = .64$$

$$\Rightarrow \boxed{\cos \theta = .8}$$

b.)  $\tan \theta$

$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{.6}{.8} = \boxed{\frac{3}{4}}$$

7.) Use trigonometric identities to transform one side of the equation into the other

$$\left(0 < \theta < \frac{\pi}{2}\right):$$

a.)  $\tan \theta \cot \theta = 1$

$$\frac{\cancel{\tan \theta}}{\cancel{\tan \theta}} = 1$$

b.)  $\frac{\tan \theta + \cot \theta}{\tan \theta} = \csc^2 \theta$

$$\frac{\tan \theta + \cot \theta}{\tan \theta} = 1 + \cot^2 \theta$$

and  $1 + \cot^2 \theta = \csc^2 \theta$   
is a trig identity.

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8.) Find the value of the six trigonometric formulas given that

a.)  $\sin \theta = \frac{3}{5}$  and  $\theta$  lies in Quadrant II.

$$\begin{aligned} \cos \theta &= -\frac{4}{5} & \csc \theta &= \frac{5}{3} \\ \tan \theta &= -\frac{3}{4} & \sec \theta &= -\frac{5}{4} \\ & & \cot \theta &= -\frac{4}{3} \end{aligned}$$

b.)  $\tan \theta = \frac{-15}{8}$  and  $\sin \theta < 0$ .

$$\begin{aligned} (-15)^2 + 8^2 &= 225 + 64 = 289 & \sqrt{289} &= 17 \\ \sin \theta &= -\frac{15}{17} & \csc \theta &= -\frac{17}{15} \\ \cos \theta &= \frac{8}{17} & \sec \theta &= \frac{17}{8} \\ \tan \theta &= -\frac{15}{8} & \cot \theta &= -\frac{8}{15} \end{aligned}$$

9.) Evaluate:

a.)  $\sec \pi$

$$\begin{aligned} \frac{1}{\cos \pi} &= \frac{1}{-1} \\ &= \boxed{-1} \end{aligned}$$

b.)  $\tan \frac{\pi}{2}$

$$\tan \frac{\pi}{2} = \infty$$

10.) Find the reference angle for each of the following:

a.)  $\theta = 208^\circ$

$$28^\circ$$

b.)  $\theta = -292^\circ$

$$68^\circ$$

c.)  $\theta = \frac{11\pi}{5}$

$$\frac{\pi}{5}$$

d.)  $\theta = \frac{17\pi}{7}$

$$\frac{3\pi}{7}$$

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11.) Evaluate the sine, cosine, and tangent of the angle.

$$\begin{aligned} \text{a.) } \frac{5\pi}{3} \quad \sin\left(\frac{5\pi}{3}\right) &= -\frac{\sqrt{3}}{2} \\ \cos\left(\frac{5\pi}{3}\right) &= \frac{1}{2} \\ \tan\left(\frac{5\pi}{3}\right) &= -\sqrt{3} \end{aligned}$$

$$\begin{aligned} \text{b.) } -\frac{7\pi}{6} \quad \sin\left(-\frac{7\pi}{6}\right) &= -\frac{1}{2} \\ \cos\left(-\frac{7\pi}{6}\right) &= -\frac{\sqrt{3}}{2} \\ \tan\left(-\frac{7\pi}{6}\right) &= \frac{1}{\sqrt{3}} \end{aligned}$$

$$\begin{aligned} \text{c.) } \frac{11\pi}{4} \quad \sin\left(\frac{11\pi}{4}\right) &= \frac{1}{\sqrt{2}} \\ \cos\left(\frac{11\pi}{4}\right) &= -\frac{1}{\sqrt{2}} \\ \tan\left(\frac{11\pi}{4}\right) &= -1 \end{aligned}$$

12.) Find  $\cos \theta$  if  $\sin \theta = -\frac{3}{5}$  and the angle lies in Quadrant IV.

$$\cos \theta = \frac{4}{5}$$

13.) Find  $\sec \theta$  if  $\tan \theta = \frac{3}{2}$  and the angle lies in Quadrant III.

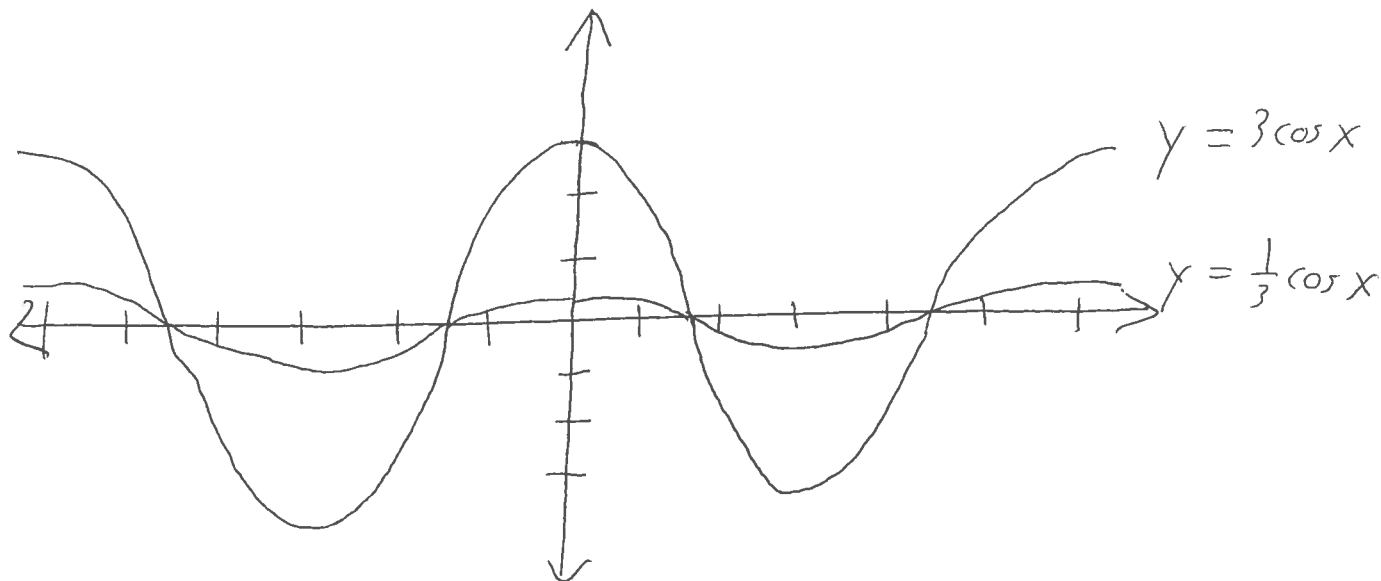
$$3^2 + 2^2 = 13$$

$$\cos \theta = -\frac{2}{\sqrt{13}}$$

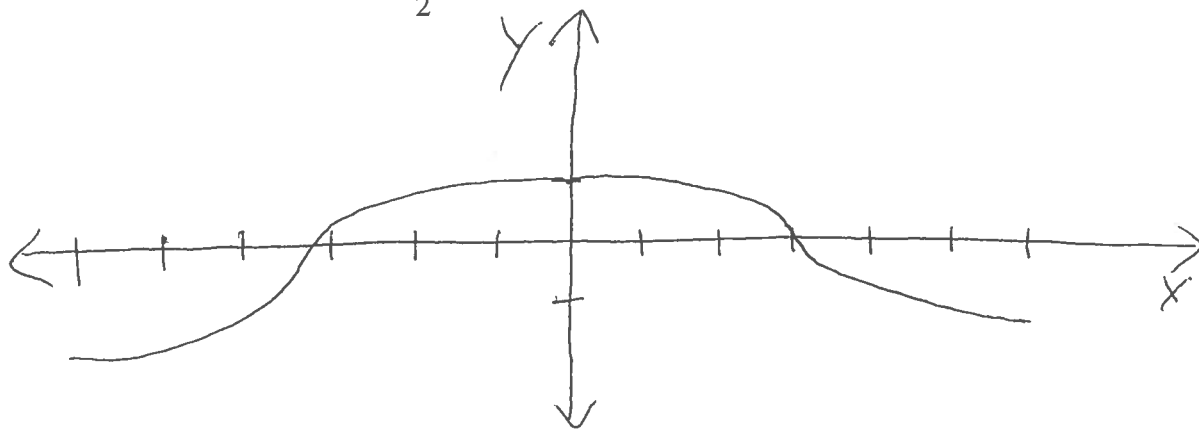
$$\boxed{\sec \theta = -\frac{\sqrt{13}}{2}}$$

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14.) Sketch the graphs of  $y = 3\cos x$  and  $y = \frac{1}{3}\cos x$ .



15.) Sketch the graph of  $y = \cos \frac{x}{2}$ .



16.) Sketch the graph of  $y = 2\sin\left(x - \frac{\pi}{4}\right)$ .

