

Name:

Class time:

M305G - Practice Exam III - November 2008

Carefully read each question, and be sure to show your work.

1. (a) Convert these angles to radians:  $260^\circ$ ,  $-400^\circ$

(b) Convert these angles to degrees:  $-\frac{\pi}{8}$ ,  $\frac{9\pi}{2}$

(c) Find the exact value of the expression:  $\cos\left(-\frac{5\pi}{4}\right) - \cos\frac{3\pi}{4}$

(d) Find the exact value of the expression:  $2\sin^2 60^\circ - 3\cos 45^\circ$

(e) If  $f(x) = \sin x$  and  $f(a) = \frac{3}{5}$ , find  $f(-a)$ .

(f) If the point  $(2, 7)$  is on the terminal side of the angle  $\theta$  in standard position, find the exact value of  $\sin \theta$ . (Hint: what is  $r$ ?)

2. In these problems, find the value of the remaining five trigonometric functions of  $\theta$ :

(a)  $\sin \theta = \frac{5}{7}$ ,  $\theta$  in quadrant II

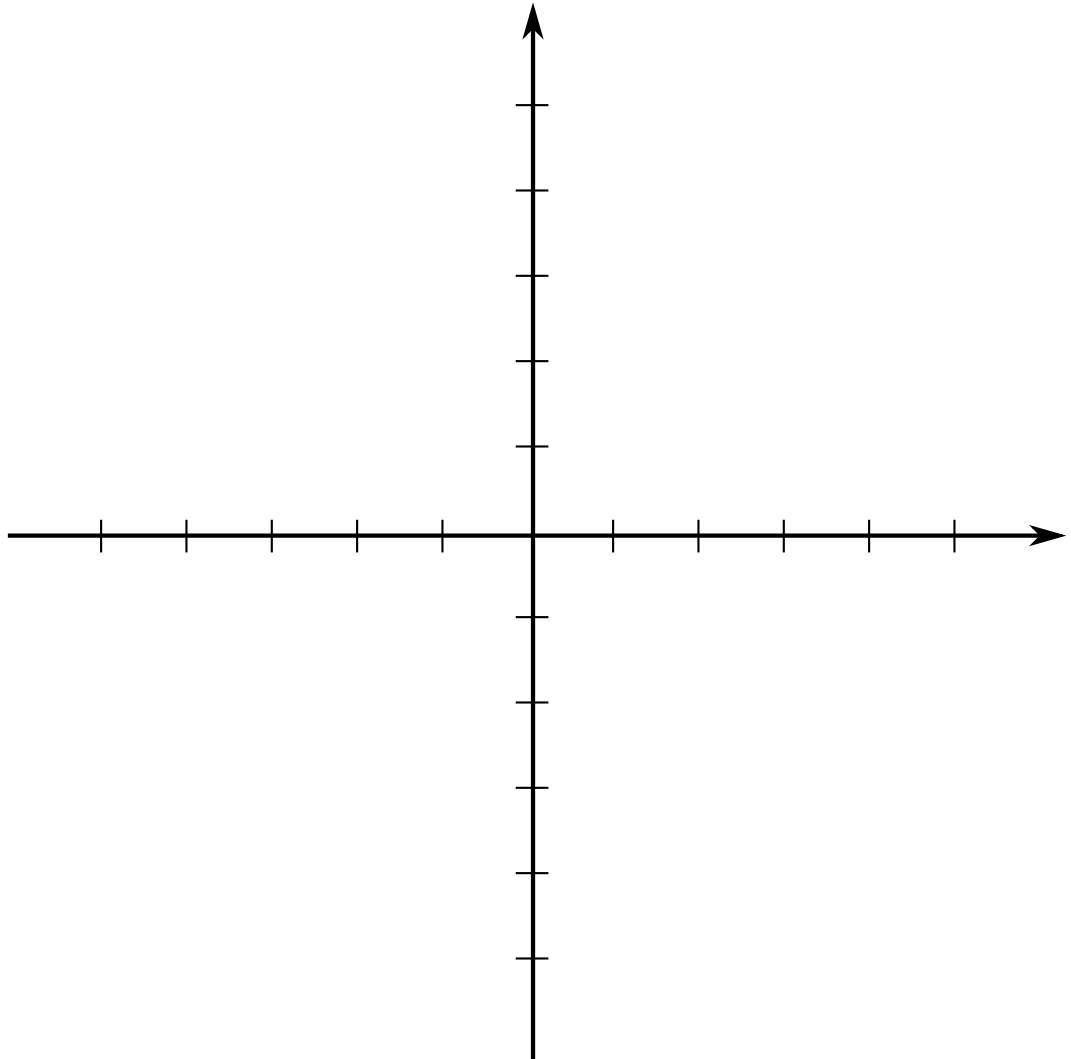
(b)  $\cos \theta = \frac{2}{3}$ ,  $\frac{3\pi}{2} < \theta < 2\pi$

3. This problem concerns the properties and graphs of sinusoidal functions.

(a) Construct a function  $f(x)$  for a sinusoidal graph with the following properties:

$$A = -3, \text{ period} = \frac{2\pi}{3}, \text{ and phase shift} = -\frac{\pi}{4}$$

(b) Graph the function  $y = 2 \sin\left(\frac{x}{3} - \frac{\pi}{6}\right)$



4. Find the exact value of each expression.

(a)

$$\sec^{-1}\left(\frac{2}{\sqrt{3}}\right)$$

(b)

$$\sin^{-1}\left(\sin \frac{11\pi}{5}\right)$$

(c)

$$\cot\left(\csc^{-1}\sqrt{10}\right)$$

(d)  $\cos 15^\circ$  (Hint: what is  $60^\circ - 45^\circ$ ?)

5. Establish each identity.

(a)

$$\sin \theta \tan \theta + \cos \theta = \sec \theta$$

(b)

$$\frac{\csc \theta + \cot \theta}{\sec \theta + \tan \theta} = \frac{\sec \theta - \tan \theta}{\csc \theta - \cot \theta}$$