Quiz 6 Name: _____

Math 1060–5

Friday, October 26, 2012

Directions: Show all work for full credit. Clearly indicate all answers. Simplify all mathematical expressions completely. No calculators are allowed.

Formulas

$$\sin(u+\mathrm{v}) = \sin u\cos \mathrm{v} + \cos u \sin \mathrm{v} \qquad \sin 2u = 2\sin u \cos u$$

$$\sin(u-\mathrm{v}) = \sin u\cos \mathrm{v} - \cos u \sin \mathrm{v} \qquad \cos 2u = \cos^2 u - \sin^2 u$$

$$\cos(u+\mathrm{v}) = \cos u\cos \mathrm{v} - \sin u \sin \mathrm{v} \qquad = 2\cos^2 u - 1$$

$$\cos(u-\mathrm{v}) = \cos u\cos \mathrm{v} + \sin u \sin \mathrm{v} \qquad = 1 - 2\sin^2 u$$

$$\tan(u+\mathrm{v}) = \frac{\tan u + \tan \mathrm{v}}{1 - \tan u \tan \mathrm{v}} \qquad \tan 2u = \frac{2\tan u}{1-\tan^2 u}$$

$$\tan(u-\mathrm{v}) = \frac{\tan u - \tan \mathrm{v}}{1 + \tan u \tan \mathrm{v}} \qquad \cos\frac{u}{2} = \pm\sqrt{\frac{1+\cos u}{2}}$$

$$\sin\frac{u}{2} = \pm\sqrt{\frac{1-\cos u}{2}} \qquad \tan\frac{u}{2} = \frac{1-\cos u}{\sin u} = \frac{\sin u}{1+\cos u}$$

1. Find the exact value of each of the following: (13 points each)

   (a) $\sin\dfrac{11\pi}{12}$ (Hint: $\dfrac{11\pi}{12} = \dfrac{3\pi}{4} + \dfrac{\pi}{6}$.)

   (b) $\cos\dfrac{17\pi}{12}$ (Hint: $\dfrac{17\pi}{12} = \dfrac{9\pi}{4} - \dfrac{5\pi}{6}$.)

(c) $\tan \dfrac{\pi}{12}$

2. Let $\sin u = \dfrac{4}{5}$, where u is an angle in Quadrant II. Find $\sin 2u$. (11 points)