Math 51 (7:30am – 8:20am)
Quiz 6
Fri May 29, 2009

SCORE: ___ / 20 POINTS

What month is your birthday ? ___ ___
What are the first 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your social security number ? ___ ___
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

NO CALCULATORS ALLOWED

Find the exact value of $\cos\frac{5\pi}{12}$. **SHOW YOUR WORK. SIMPLIFY YOUR ANSWER.** **SCORE: ___ / 3 POINTS**

$$\cos\left(\frac{3\pi}{12}+\frac{2\pi}{12}\right)=\cos\left(\frac{\pi}{4}+\frac{\pi}{6}\right)$$
$$=\cos\frac{\pi}{4}\cos\frac{\pi}{6}-\sin\frac{\pi}{4}\sin\frac{\pi}{6}$$
$$=\frac{\sqrt{2}}{2}\frac{\sqrt{3}}{2}-\frac{\sqrt{2}}{2}\frac{1}{2}$$
$$=\frac{\sqrt{6}-\sqrt{2}}{4}$$

Find the exact value of $\cos 160^\circ \sin 40^\circ - \sin 160^\circ \cos 40^\circ$. **SCORE: ___ / 2 POINTS**
SHOW YOUR WORK. SIMPLIFY YOUR ANSWER.

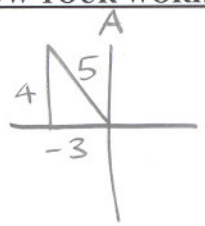
$$\sin(40^\circ-160^\circ)$$
$$=\sin(-120^\circ)$$
$$=-\frac{\sqrt{3}}{2}$$

Write $\tan(45^\circ-\theta)$ as an expression involving trigonometric functions of θ. **SCORE: ___ / 3 POINTS**
SHOW YOUR WORK. SIMPLIFY YOUR ANSWER.

$$\frac{\tan 45^\circ-\tan\theta}{1+\tan 45^\circ\tan\theta}=\frac{1-\tan\theta}{1+\tan\theta}$$

If $\sin A = \frac{4}{5}$, and $\cos B = -\frac{5}{13}$, and A is in the 2nd quadrant, and B is in the 3rd quadrant, find $\sin(A+B)$. **SCORE: ___ / 4 POINTS**

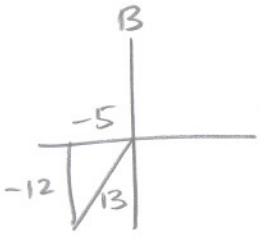
SHOW YOUR WORK. SIMPLIFY YOUR ANSWER.



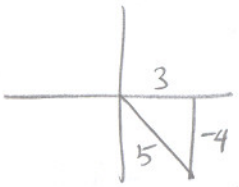
$$\sin A \cos B + \cos A \sin B$$

$$= \frac{4}{5}\left(-\frac{5}{13}\right) + \left(-\frac{3}{5}\right)\left(\frac{-12}{13}\right)$$

$$= \frac{16}{65}$$



If $\cos\theta = \frac{3}{5}$, and $\sin\theta < 0$, find $\tan 2\theta$. **SHOW YOUR WORK. SIMPLIFY YOUR ANSWER.** **SCORE: ___ / 4 POINTS**



$$\frac{2\tan\theta}{1-\tan^2\theta}$$

$$= \frac{2\left(-\frac{4}{3}\right)}{1-\left(-\frac{4}{3}\right)^2}$$

$$= \frac{-\frac{8}{3}}{1-\frac{16}{9}}$$

$$= \frac{-\frac{8}{3}}{-\frac{7}{9}}$$

$$= -\frac{8}{3}\cdot\frac{-9}{7}$$

$$= \frac{24}{7}$$

If $\cos 2\theta = \frac{4}{5}$, and $90^\circ < \theta < 180^\circ$, find $\sec\theta$. **SHOW YOUR WORK. SIMPLIFY YOUR ANSWER.** **SCORE: ___ / 4 POINTS**

$$2\cos^2\theta - 1 = \frac{4}{5}$$

$$2\cos^2\theta = \frac{9}{5}$$

$$\cos^2\theta = \frac{9}{10}$$

$$\cos\theta = \pm\frac{3}{\sqrt{10}} = -\frac{3}{\sqrt{10}} \longrightarrow \sec\theta = \frac{1}{\cos\theta} = -\frac{\sqrt{10}}{3}$$

θ IN Q_2

$\cos\theta < 0$