Math 3200: Chapter 6 Quiz **NAME:** ____________

Part A: Choose the most appropriate response and place the corresponding letter in the space provided.

1. Which is equivalent to $\sin(360^0 + x)$? 1. C

A) $-\cos x$ B) $-\sin x$
C) $\sin x$ D) $\cos x$

2. What is the simplified form of $(1+\tan^2 x)(1-\cos^2 x)$? 2. B

A) $-\tan^2 x$ B) $\tan^2 x$
C) -1 D) 1

3. Evaluate : $\cos\frac{5\pi}{12}\cos\frac{\pi}{12} - \sin\frac{5\pi}{12}\sin\frac{\pi}{12}$ 3. A

A) 0 B) 1

C) -1 D) undefined

4. What is $\sin 2x$ if $\sin x = -\frac{4}{5}$ and $\pi < x < \frac{3\pi}{2}$ 4. C

A) $-\frac{25}{24}$ B) $-\frac{24}{25}$
C) $\frac{24}{25}$ D) $\frac{25}{24}$

5. Which expression is equivalent to $6\sin 8y\cos 8y$? 5. A

A) $3\sin 16y$ B) $\sin 16y$
C) $\sin 8y$ D) $3\sin 4y$

6. What are the non-permissible values of θ for the expression $\sin^2\theta - \tan^2\theta + \cos^2\theta - 2$?. 6. B

A) $\theta \neq \frac{\pi k}{2}, k \in I$ B) $\theta \neq \frac{\pi}{2} + \pi k, k \in I$
C) $\theta \neq \pi k, k \in I$ D) All real values are permissible.

7. What are the non-permissible values of θ for the expression $\cot\theta\left(\sec^2\theta - 1\right)$? 7. B

A) $\theta \neq \frac{\pi}{2} + \pi k, k \in I$ C) $\theta \neq \pi k, k \in I$

B) $\theta \neq \frac{\pi k}{2}, k \in I$ D) All real values are permissible.

8. What is the exact value of the expression $\dfrac{\tan\frac{11\pi}{12} + \tan\frac{5\pi}{6}}{1 - \tan\frac{11\pi}{12}\tan\frac{5\pi}{6}}$? 8. B

A) 1 B) -1

C) $-\frac{1}{\sqrt{2}}$ D) $\frac{1}{\sqrt{2}}$

Part B: Show all workings for each of the following questions.

9. Evaluate : $\sin\frac{\pi}{12}$. Express as an exact value. (3)

(.5)

$\sin\left(\frac{\pi}{4}-\frac{\pi}{6}\right) = \sin\frac{\pi}{4}\cos\frac{\pi}{6} - \cos\frac{\pi}{4}\sin\frac{\pi}{6}$ (1)

$= \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2}\cdot\frac{1}{2}$ (1)

$= \frac{\sqrt{6}-\sqrt{2}}{4}$ (.5)

10. Simplify completely: $sin\left(x+\frac{\pi}{6}\right) + cos\left(x+\frac{\pi}{3}\right)$ (4)

$= \sin x\cos\frac{\pi}{6} + \cos x\sin\frac{\pi}{6} + \cos x\cos\frac{\pi}{3} - \sin x\sin\frac{\pi}{3}$ (1)

$= \sin x\frac{\sqrt{3}}{2} + \cos x\frac{1}{2} + \cos x\frac{1}{2} - \sin x\frac{\sqrt{3}}{2}$ (2)

$= \frac{1}{2}\cos x + \frac{1}{2}\cos x = \cos x$ (1)

11. Prove **any 2** of the following: (4 each)

a) $1-(sinx+cosx)^2 = -sin2x$

$= 1 - (\sin x+\cos x)(\sin x+\cos x)$ (1)

$= 1 - \left[\sin^2 x + 2\sin x\cos x + \cos^2 x\right]$

$= \cos^2 x - 2\sin x\cos x - \cos^2 x$ (1)

$= -2\sin x\cos x$ (1)

$-2\sin x\cos x$ (1)

b) $\frac{1}{sin2x} + cot2x = cotx$

(1) $\frac{1}{2\sin x\cos x} + \frac{\cos 2x}{\sin 2x}$

$= \frac{1+\cos 2x}{2\sin x\cos x}$ (1)

$1 + 2\cos x - 1$

$= \frac{2\cos^2 x}{2\sin x\cos x}$ (1)

$= \frac{\cos x}{\sin x}$ (1)

$\frac{\cos x}{\sin x}$

c) $\frac{sin^2x-2sinx-3}{sin^2x-1} = \frac{sinx-3}{sinx-1}$

$\frac{(\sin x-3)(\cancel{\sin x}+1)}{(\sin x-1)(\cancel{\sin x}+1)}$

$\frac{\sin x-3}{\sin x-1}$