

Instructor: Sal Barone

Name: _____

GT username: _____

1. No books or notes are allowed.
2. No electronic devices are allowed.
3. Show all work and fully justify your answer to receive full credit.
4. Please BOX your answers.
5. Good luck!

Page	Max. Possible	Points
1	24	
2	22	
3	30	
4	24	
Total	100	

$$\cos(u - v) = \cos u \cos v + \sin u \sin v$$

$$\sin(u - v) = \sin u \cos v - \cos u \sin v$$

1. Is the following system consistent or inconsistent? Solve the system if it is consistent. (14 pts.)

$$\begin{aligned}3x - y - 2 &= 3 \\ y + z &= 1 \\ 2x + 2y &= 2\end{aligned}$$

2. If $\cos \alpha = \frac{3}{5}$ and $\frac{3\pi}{2} < \alpha < 2\pi$, find $\cot \alpha$ and $\csc \alpha$. (10 pts.)

3. Verify the identity.

(10 pts.)

$$\frac{\sin(x + y)}{\cos x \cos y} = \tan x + \tan y$$

4. Solve the equation for all x in $[0, 2\pi)$.

(12 pts.)

$$2 \sin^2 x - 1 = 0$$

5. State the double-angle identity for $\cos 2x$.

(8 pts.)

$$\cos 2x = \underline{\hspace{10em}}$$

6. State the power-reducing identity for $\cos^2 x$.

(8 pts.)

$$\cos^2 x = \underline{\hspace{10em}}$$

7. Find the exact value of $\sec \theta$, $\cot \theta$ and $\sin \theta$ if θ lies in quadrant II and satisfies $\sin \theta = \frac{24}{25}$.

(14 pts.)

8. Find the exact value of $\sin 2\theta$ if $\sin \theta = \sqrt{23}$, $0 < \theta < \frac{\pi}{2}$. (8 pts.)

9. Find the exact value of $\sin 15^\circ$. (8 pts.)

10. Find the exact value of $\cos(75^\circ)$. (8 pts.)