

Student Name: _____

Show all relevant work (use back of pages for scratch paper, if needed). **CIRCLE FINAL ANSWERS.**
Each problem is worth 8 points (and you get one point for clearly writing your name above).

1. Find the exact value of each expression (show answers as fractions not decimals).

a) $\tan\left(-\frac{\pi}{12}\right)$

b) $\sin 105^\circ$

2. Write out the Addition Formula for cosine:

$$\cos(\theta + \phi) =$$

3. Write out the Double-Angle Formula for tangent:

$$\tan 2\theta =$$

4. Circle any of the following expressions (possibly more than one) that is equivalent to $\sin \theta$

$$\cos\left(\frac{\pi}{2} - \theta\right)$$

$$\frac{1}{\csc \theta}$$

$$\sin(-\theta)$$

$$\cos^2 \theta$$

5. Evaluate $\cos(\theta - \phi)$ given that $\tan \theta = \frac{4}{3}$, θ in Quadrant III, $\sin \phi = \frac{-\sqrt{33}}{7}$, ϕ in Quadrant IV.

6. Find the exact value (fractions not decimals) of: $\cos\left(2 \tan^{-1} \frac{12}{5}\right)$

7. Find all solutions for θ in the given equations (answers may be in either degrees or radians).

a) $\sin(3\theta) - 2\sin^2(3\theta) = 0$

b) $\tan\theta = 7$

c) $\cos 2\theta = 3\sin\theta - 1$

8. Circle the one expression below that is equal to: $\tan\theta + \cot\theta = ??$

A. $\cos\theta + \sin\theta$

B. $\sec\theta \csc\theta$

C. $\sec^2\theta$

D. $2 + \sin\theta$

9. Circle the one expression below that is equal to: $\sin^2\theta \cot^2\theta + \cos^2\theta \tan^2\theta = ??$

A. $\cos 2\theta$

B. $\csc^2\theta$

C. 1

D. $2\sin\theta$

10. Circle the one expression below that is equal to: $1 + \tan\theta \tan\frac{\theta}{2} = ??$

A. $\csc\theta$

B. $\cos\theta + 1$

C. $\cot^2\theta$

D. $\sec\theta$