

Name: \_\_\_\_\_ Period: \_\_\_\_\_

**Ch. 6 Group Test (Analytic Trigonometry) [56 pts]**

**Show all work and simplify answers.**

**Group Test**

**1) Establish the identity. [3 pts]**

$$\cos^2 \theta (1 + \tan^2 \theta) = 1$$

**2) Establish the identity. [2 pts]**

$$1 - \frac{\cos^2 \theta}{1 + \sin \theta} = \sin \theta$$

**3) Solve for  $\theta$  on the interval  $[0, 2\pi)$ . [5 pts]**

$$\sqrt{3} \sec(3\theta) - 2 = 0$$

**4) Solve for  $\theta$  on the interval  $[0, 2\pi)$ . [5 pts]**

$$\sin\left(\frac{1}{3}\theta\right) = \frac{\sqrt{3}}{2}$$

5) Find the exact value of the expression using a sum and difference formula. [7 pts]

$$\cos\left(\frac{19\pi}{12}\right)$$

6) Find the exact value of the expression. [3 pts]

$$\cos\left(\cos^{-1}\frac{3}{8} - \sin^{-1}\frac{8}{13}\right)$$

7) Given  $\tan \theta = \frac{5}{7}$ ,  $\sin \theta < 0$ , draw a reference triangle and complete parts a) and b). [5 pts]

a) Find the exact value of the expression using the reference triangle above. [7 pts]

$$\cos(2\theta)$$

b) Find the exact value of the expression using the reference triangle above. [3 pts]

$$\cot(2\theta)$$

8) Use a half-angle formula to find the exact value of the expression. [7 pts]

$$\cos\left(\frac{7\pi}{8}\right)$$

9) Use a half-angle formula to find the exact value of the expression. [3 pts]

$$\cot\left(\frac{\pi}{12}\right)$$

Find the exact value of each of the following [2 pts each]

10)  $\sin^{-1}\left(-\frac{1}{2}\right)$

11)  $\tan\left(\cos^{-1}\left(-\frac{3}{7}\right)\right)$

12)  $\sec\left(\tan^{-1}\left(-\frac{4}{3}\right)\right)$