



1. Simplify  $(\sec x + \tan x)(1 - \sin x)$  to a single trig function.(5pts)

2. Prove the following, and be sure to write each step: (5 pts)

$$\tan x + \sec x = \frac{\csc x + 1}{\cot x}$$

3. Find the exact value of (5 pts each)

a.  $\sin \frac{17\pi}{12}$

b.  $\cos \frac{17\pi}{12}$

4. Prove that  $2 \cos x \sin y = \sin(x + y) - \sin(x - y)$ . Be sure to write each step. (5 pts)

5. Find the exact value of the following: (5 pts each)

a.  $\sin \frac{13\pi}{6}$

b.  $\cos \left( -\frac{\pi}{6} \right)$

c.  $\tan \left( \frac{25\pi}{4} \right)$

6. Which of the statements **(i)-(iii)** are true? (5 pts)

i.  $\sin(-x) = -\sin x$

ii.  $\cos(-x) = -\cos x$

iii.  $\tan(-x) = -\tan x$

- a. **(i)** and **(ii)** only
- b. **(ii)** only
- c. **(i)** and **(iii)** only
- d. all of them
- e. none of them

7. If  $\sin \left( -\frac{101\pi}{2} \right) = -1$ , then what does  $\sin \left( -\frac{105\pi}{2} \right)$  equal? (5 pts)

8. Graph the following trig functions over two periods. Be sure to label all intercepts, axes and asymptotes if any.(5 pts each)

a.  $3 \sin\left(2x + \frac{\pi}{2}\right)$

b.  $\frac{1}{2} \sec\left(\frac{x}{2}\right)$

c.  $6 \tan\left(x - \frac{\pi}{4}\right)$

9. Evaluate the following: (5 pts each)

a.  $\cos^{-1}\frac{1}{2}$

b.  $\cos^{-1}0$

c.  $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

10. Find the exact value of:  $\cos\left(\sin^{-1}\left(-\frac{1}{3}\right)\right)$  (5 pts.)

11. Below is the third quadrant of the unit circle. For all angles shown (as well as the x-axis and the y-axis), label the following:
- The angle measurements in degrees (5 pts)
  - The angle measurements in radians (5 pts)
  - The coordinates of the points on the circle. (5pts)

