

Math 173 – Assignment #4

Name: _____

1. Convert the angles in radians to degrees and the angles in degrees to radians. Show your work. Leave in terms of π , if appropriate.

a) 135° _____

b) $-\frac{11\pi}{6}$ _____

c) -90 _____

2. Use a calculator to evaluate the following trig functions. Round to two decimal places.

a) $\csc 10.5$ _____

b) $\sin\left(-\frac{\pi}{9}\right)$ _____

c) $\sin^{-1} 0.77$ _____

3. Find the exact value of following trig function.

$\sec\left(-\frac{3\pi}{4}\right)$ _____

4. Simplify. $\frac{1}{1 - \sin x} + \frac{1}{1 - \sin(-x)}$ _____

5. Use the sum/difference identities to find an equivalent expression for $\csc\left(x + \frac{\pi}{2}\right)$. _____

6. Use the sum/difference identities to evaluate $\sin 105^\circ$ exactly. _____

7. Simplify. _____

$$\sin(A - B) \cos B + \cos(A - B) \sin B$$

8. Let $x = a \cos \theta$. Substitute into $\sqrt{a^2 - x^2}$ and simplify, so that your answer is a trigonometric function of θ without radicals. Assume that θ is in the first quadrant so all trig functions are positive. _____

9. If $\cos \theta = \frac{5}{13}$ and θ is in quadrant I, find the exact value of $\sin 2\theta$, $\cos 2\theta$, and $\tan 2\theta$.
State also the quadrant in which the angle 2θ lies.

10. Prove the following trig identities.

a)
$$\frac{\cos^3 \theta - \sin^3 \theta}{\cos \theta - \sin \theta} = \frac{2 + \sin 2\theta}{2}$$

b)
$$(\sin x + \cos x)(\sec x + \csc x) = \frac{\sec^2 x + 2 \tan x}{\tan x}$$

11. Evaluate $\tan\left(\cos^{-1}\frac{3}{x}\right)$. Assume all angles are in QI. _____

12. Solve, finding all solutions in either $[0,360^\circ)$ or $[0,2\pi)$.

a) $\sin 2x = \sin x$ _____

b) $2 \cos^2 x - \cos x = 1$ _____

13. Sketch a graph of the function $y = -3\cos(x + \pi)$, and state the function's period, amplitude, domain, and range. Include at least one full period in your sketch.

period: _____

amplitude: _____

domain: _____

range: _____



14. Sketch a graph of the function $y = \cot x$, and state the function's period. Include at least two full periods in your sketch. State whether the function is even, odd, or neither.

period: _____

