

- 2.2 – Verifying Trigonometric Identities
2.3 – Solving Trigonometric Equations
2.4 – Sum and Difference Formulas

Be sure to follow [College Algebra formatting guidelines](#) in your work.

Be sure to show all work and circle final answers.

1. Write an algebraic expression that is equivalent to the given expression.

a. (5 pts) $\csc\left(\arctan\left(\frac{x}{a}\right)\right)$

b. (5 pts) $\cos\left(\arcsin\left(\frac{x-h}{r}\right)\right)$

2. Verify the identity algebraically.

a. (5 pts) $\frac{\cos(\theta)\cot(\theta)}{1-\sin(\theta)} - 1 = 5\csc(\theta)$

b. (5 pts) $\sqrt{\frac{1+\cos(\theta)}{1-\sin(\theta)}} = \frac{1+\cos(\theta)}{|\sin(\theta)|}$

3. Solve the following trigonometric equations:

a. (5 pts) $\frac{\sqrt{2}}{2}\csc(\theta) - 1 = 0$

b. (5 pts) $\sin(2x)(2\sin(x)+1) = 0$

4. Find the *exact* values of sine, cosine and tangent of the following angle measures:

a. (5 pts) $\theta = 75^\circ$

b. (5 pts) $\theta = \frac{13\pi}{12}$

5. (5 pts) Suppose that $\sin(u) = -\frac{3}{5}$, $\cos(u) < 0$ and $\cos(v) = \frac{14}{17}$, $\tan(v) < 0$. Find the exact value of $\cos(u+v)$.

6. (5 pts) Find the exact value of $\sin(\arctan(3x) - \arccos(2x))$.