MAT 1420   Week 6 Written Assignment
30 pts   Covers Sections 2.2 – 2.4

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. Just use "1420" in the top left corner, instead of "1340." I think I got them mixed up in previous assignments.

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) $\csc\left(\arctan\left(\dfrac{x}{a}\right)\right)$

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

2. Verify the identity algebraically.

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

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

3. Solve the following trigonometric equations:

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

   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) $\theta=75^{0}$

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

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

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