

**Summer STEM Academy – Summer 2008**  
**Trig Quiz 1– Make-up**

**Your Name:** \_\_\_\_\_

Solve all six questions. Hand in by Wed, June 25th for extra-credit. Do not use a calculator.  
Show all your work.

1 [5] \_\_\_\_\_

2 [5] \_\_\_\_\_

3 [5] \_\_\_\_\_

4 [5] \_\_\_\_\_

5 [5] \_\_\_\_\_

6 [5] \_\_\_\_\_

TOTAL (25)

1. Given that  $\tan \alpha = \sqrt{3}/4$ , find  $\sin \alpha$ ,  $\cos \alpha$ , and  $\cot \alpha$ .

2. Evaluate

$$(2 \sin 45^\circ \cos 45^\circ - \sin 30^\circ \cos 30^\circ)^2$$

3. In an isosceles triangle  $ABC$  with  $AB = BC$ , the base,  $AC$ , is six inches long. Given that the angle at the vertex  $B$  is  $120^\circ$ , find the distance from  $C$  to the line  $AB$ .

4. Check the identity

$$\frac{1 + 2 \sin t \cos t}{(\sin t + \cos t)^2} = 1$$

5. Simplify

$$(4 \sin x + 5 \cos x)^2 + (5 \sin x - 4 \cos x)^2$$

6. Check the identity

$$\frac{\sin^2 t}{\tan^2 t} + \frac{\cos^2 t}{\cot^2 t} + \frac{\cot t}{\tan t} = \frac{1}{\sin^2 t}$$