Name: _____

Thursday, March 13, 2014

MTH 113 Test 2 (Chapter 5)

1. (14 pts.) Suppose that **sin α =** $\frac{4}{5}$ for a quadrant II angle α and **sin β =** $\frac{5}{13}$ for a quadrant I angle β. Find the exact value of the following (hint: find sin / cos / tan of the angles first – simplify / leave in radical signs)…

   sin (α – β) **cos (α + β)**

2. (6 pts.) Find the exact value (include radical signs / leave no radical sign in the denominator as necessary) of **tan(105^o) = tan(45^o + 60^o)** using the sum formula

3. (14 pts.) Suppose that **sin θ =** $\frac{7}{9}$ for a quadrant I angle θ. Find the exact value of the following (leave in radical signs / simplify)…

   sin (2θ) **cos (2θ)**

4. (8 pts.) Use a half-angle formula to find the exact value (leave in radical signs as necessary) of **tan (75^o)**

--- hint: use one of the tan half-angle formulas without a radical sign ---

5. (10 pts.) Express each sum or difference as a product (if possible, find this product's exact value)

cos(5x) + cos(3x) **sin(165^o) – sin (105^o)**

6. (10 pts.) Express each product as a sum or difference

sin(7x) cos(3x) **sin(5x) sin(2x)**

7. (16 pts.) Solve each equation (find all solutions on the interval [0, 2π) answer in radians)

cos 2x = $\frac{1}{2}$ **$\sin^2(\theta) - 5 = 4\sin(\theta)$**

8. (7 pts.) With Easter approaching, the Easter Bunny is practicing his egg-throwing skills. If he wants to throw his eggs with an initial velocity of $v_0 = 90$ feet per second, at what angle of elevation will he need to throw it to intercept someone standing 100 feet away (round answer to 2 decimal places)? Use the formula…

$$d = \frac{v_0^2}{16} \sin\theta \cos\theta$$

BONUS: