Pre-Calculus Notes Name: _____

Section 5.5 – Double Angles

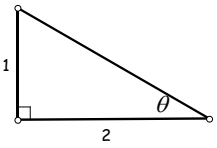
Refer to your formula sheet for the Double Angle Formulas.

Example 1: Use double-angle identities to find the exact value. GIVEN: $\cos\theta = -\frac{5}{13}$ and $\frac{\pi}{2} < \theta < \pi$.

A. $\sin 2\theta$	B. $\cos 2\theta$	C. $\tan 2\theta$

Would I want to use the double-angle identity in order to find the EXACT VALUE of $\sin 120^\circ$? **EXPLAIN**.

Example 2: Use double-angle identities to find the exact value. GIVEN:



1. $\sin\theta$	2. $\cos\theta$	3. $\tan\theta$
4. $\sin 2\theta$	5. $\cos 2\theta$	6. $\tan 2\theta$
7. $\csc 2\theta$	8. $\sec 2\theta$	9. $\cot 2\theta$

Now, use your *double angle* formulas to help you solve the following equations.

Example 3: $2\cos x + \sin(2x) = 0$

Example 4: $\cos(2x) - \cos x = 0$

Example 5:
Ignoring air resistance, the range of a projectile fired at an angle θ with the horizontal and with an initial velocity of v_0 ft per second is given by: $r = \frac{1}{16} v_0^{\,2} \sin\theta\cos\theta$ where r is the horizontal distance (in feet) that the projectile will travel. A place kicker for the football team can kick a football from ground level with an initial velocity of 80 feet per second.

(A) Write the projectile motion model in simpler form.

$r = \frac{1}{16} v_0^{\,2} \sin\theta\cos\theta =$ _____

(B) At what angle must the player kick the football so that the football travels 200 feet?

(C) For what angle is the horizontal distance the football travels a maximum?