**5.5 Multiple Angle and Product-To-Sum Formulas**

**Objective: Use formulas to rewrite and evaluate trig functions**

*Double-Angle Formulas [page 405]*

**Example 1 (Solving Multiple Angle)**

Solve

Double-Angle Formula

Factor

Zero-Product… Solve

Solutions in [0, 2

So in general the solution is:

*Power-Reducing Formulas [page 407]*

**Example 2 (Power Reducing Formulas)**

Rewrite as a sum of first powers of cosines of multiple angles

() Power reduce, FOIL

FOIL, simplify

Factor out 1/4

Power Reduce

Distribute 1/4

Factor 1/8

*Half-Angle Formulas [page 408]*

The sign of and depends on the quadrant in which lies

**Example 3 (Half-Angle Formulas)**

Find the exact value of

Since 105 is in II, sin 105 is positive

Sub from Unit Circle

Remove radical from denominator, simplify

*Product-To-Sum Formulas [page 409]*

**Example 4 (Product-To-Sum Formulas)**

Rewrite the product

*Sum-To-Product Formulas [page 410]*

**Example 5 (Sum-To-Product Formulas)**

Find the exact value of

**Homework**

Pg 413 #11-21, 29-31, 43-49, 53-55, 59-61,   
 81-83, 91-93, 99, 107-109, 111-113 (odd on everything)