Section 5-6 Double and Half Argument Properties

**Prove Double Argument Properties:**

= sinAcosA + cosAsinA

=2sinAcosA

sin(2A) = 2sinAcosA

cos(2A) = cos(A + A)

= cosAcosA – sinAsinA

=

cos(2A) =

OR

cos(2A) =

= +

= 2

cos(2A) = 2

OR

cos(2A) =

= (1 )

= 1

cos(2A) = 1

tan(2A) = tan(A + A)

=

tan(2A) =

**Prove Half-Argument Properties:**

Take cos(2A) = 2

2 = 1 + cos(2A)

The argument A on the left is half the argument 2A on the right.

Substituting B for 2A leads to

Now take the square root of both sides

cos = + or – is determined by the Quadrant of

Next, cos(2A) = 1

Substitute B for 2A.

Now take the square root of both sides.

sin = + or – is determined by the Quadrant of

A little more difficult to prove tan so we shall not get into it right now…

tan = + or – is determined by the Quadrant of

**Example 1**:

Use the double argument property, cos(2A) = 1to express cos 120 in terms of sin 60

**Example 2**:

Suppose that A is an angle between 270and 360 and that cos A =

Find the exact value of: cos 2A and sin ½A

**Example 3**:

Suppose that A is an angle between 180 and 270 and that cos A =

Find the exact value of: sin 2A and cos ½A