

## Section 7.5 Multiple-Angle and Product-to-Sum Formulas

**Objective:** In this lesson you learned how to use multiple-angle formulas, power-reducing formulas, half-angle formulas, and product-to-sum formulas to rewrite and evaluate trigonometric functions.

Course Number

Instructor

Date

### I. Multiple-Angle Formulas (Pages 575–577)

The most commonly used multiple-angle formulas are the \_\_\_\_\_, which are listed below:

$$\sin 2u = \underline{\hspace{2cm}}$$

$$\cos 2u = \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$\tan 2u = \underline{\hspace{2cm}}$$

To obtain other multiple-angle formulas, . . .

#### *What you should learn*

How to use multiple-angle formulas to rewrite and evaluate trigonometric functions

**Example 1:** Use multiple-angle formulas to express  $\cos 3x$  in terms of  $\cos x$ .

**II. Power-Reducing Formulas** (Page 577)

**Power-reducing formulas** can be used to . . .

***What you should learn***

How to use power-reducing formulas to rewrite and evaluate trigonometric functions

The power-reducing formulas are:

$$\sin^2 u = \underline{\hspace{2cm}}$$

$$\cos^2 u = \underline{\hspace{2cm}}$$

$$\tan^2 u = \underline{\hspace{2cm}}$$

**III. Half-Angle Formulas** (Pages 578–579)

List the **half-angle formulas**:

$$\sin \frac{u}{2} = \underline{\hspace{2cm}}$$

$$\cos \frac{u}{2} = \underline{\hspace{2cm}}$$

$$\tan \frac{u}{2} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

***What you should learn***

How to use half-angle formulas to rewrite and evaluate trigonometric functions

The signs of  $\sin (u/2)$  and  $\cos (u/2)$  depend on . . .

**Example 2:** Find the exact value of  $\tan 15^\circ$ .

**IV. Product-to-Sum Formulas** (Pages 579–581)

The **product-to-sum formulas** can be used to . . .

***What you should learn***

How to use product-to-sum formulas to rewrite and evaluate trigonometric functions

The product-to-sum formulas are:

$$\sin u \sin v = \underline{\hspace{10em}}$$

$$\cos u \cos v = \underline{\hspace{10em}}$$

$$\sin u \cos v = \underline{\hspace{10em}}$$

$$\cos u \sin v = \underline{\hspace{10em}}$$

**Example 3:** Write  $\cos 3x \cos 2x$  as a sum or difference.

The **sum-to-product formulas** can be used to . . .

The sum-to-product formulas are:

$$\sin x + \sin y = \underline{\hspace{10em}}$$

$$\sin x - \sin y = \underline{\hspace{10em}}$$

$$\cos x + \cos y = \underline{\hspace{10em}}$$

$$\cos x - \cos y = \underline{\hspace{10em}}$$

**Example 4:** Write  $\cos 4x + \cos 2x$  as a sum or difference.

**Additional notes**

**Homework Assignment**

Page(s)

Exercises