Double Angle Cosine Formulas

Name _____

Date _____ Period _____

Double Angle Cosine Formula

$$\cos(2\theta) = \cos^2\theta - \sin^2\theta$$

Sum Formula for Cosine

$$\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

$$\cos(2\theta)$$

$$\cos(\theta + \theta) = \cos\theta\cos\theta - \sin\theta\sin\theta$$

$$= \cos^2\theta - \sin^2\theta$$

Double Angle Cosine Formula

$$\cos(2\theta) = \cos^2\theta - \sin^2\theta$$

$$= \cos^2\theta - (1 - \cos^2\theta) = 2\cos^2\theta - 1$$

$$= (1 - \sin^2\theta) - \sin^2\theta = 1 - 2\sin^2\theta$$

Pythagorean Identities

$$\sin^2\theta + \cos^2\theta = 1$$

$$\sin^2\theta = 1 - \cos^2\theta \qquad \cos^2\theta = 1 - \sin^2\theta$$

Double Angle Cosine Formula

$\cos(2\theta) = \cos^2\theta - \sin^2\theta$	$\cos(2\theta) = 2\cos^2\theta - 1$	$\cos(2\theta) = 1 - 2\sin^2\theta$
given $\cos\theta$ and $\sin\theta$	given only $\cos\theta$	given only $\sin\theta$

Given $\sin\theta = \frac{3}{5}$, determine the value of $\cos(2\theta)$

Double Angle Cosine Formula

$\cos(2\theta) = \cos^2\theta - \sin^2\theta$	$\cos(2\theta) = 2\cos^2\theta - 1$	$\cos(2\theta) = 1 - 2\sin^2\theta$
given $\cos\theta$ and $\sin\theta$	given only $\cos\theta$	given only $\sin\theta$

Given $\cos\theta = -\frac{1}{3}$, determine the value of $\cos(2\theta)$

Double Angle Cosine Formula

$\cos(2\theta) = \cos^2\theta - \sin^2\theta$	$\cos(2\theta) = 2\cos^2\theta - 1$	$\cos(2\theta) = 1 - 2\sin^2\theta$
given $\cos\theta$ and $\sin\theta$	given only $\cos\theta$	given only $\sin\theta$

Given $\cos\theta = -\frac{1}{2}$ and $\sin\theta = \sqrt{3}$, determine the value of $\cos(2\theta)$

Double Angle Cosine Formula

$\cos(2\theta) = \cos^2\theta - \sin^2\theta$	$\cos(2\theta) = 2\cos^2\theta - 1$	$\cos(2\theta) = 1 - 2\sin^2\theta$
given $\cos\theta$ and $\sin\theta$	given only $\cos\theta$	given only $\sin\theta$

Simplify the following expressions

$1 - 2\sin^2 22.5°$ $\qquad$ $2\cos^2\frac{\pi}{12} - 1$ $\qquad$ $\cos^2 25° - \sin^2 25°$

Prove the following identities

$$\cos 2\theta = \frac{1 - \tan^2 \theta}{1 + \tan^2 \theta}$$

Prove the following identities

$$\sec 2\theta = \frac{\sec^2 \theta}{2 - \sec^2 \theta}$$

Double Angle Cosine Formulas

$$\cos(2\theta) = \cos^2\theta - \sin^2\theta$$

$$\cos(2\theta) = 2\cos^2\theta - 1$$

$$\cos(2\theta) = 1 - 2\sin^2\theta$$