

Student Name: \_\_\_\_\_

Score: \_\_\_\_\_

### Derivatives of Trigonometric Functions

Find the derivatives of trigonometric functions:

$$y = 4 \sin^2 x + 5 \cos^2 x$$

$$y = \sin^3 x \cos x$$

$$y = 2 \sec x + \tan x$$

$$y = \frac{1 + \tan^2 x}{\sec x}$$

$$y = \sin^4 3x - \cos^4 3x$$

$$y = \frac{\sec 4x}{\tan 4x}$$

$$y = \csc^4 x - 21 \cot^2 x$$

$$y = (1 + \cos 3x)^2$$

$$y = \cot \frac{x}{2} \sin \frac{x}{2}$$

$$y = \frac{1}{\cos 6x}$$

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**Answer key**

**Derivatives of Trigonometric Functions**

$$\frac{dy}{dx} = -2 \sin x \cos x \text{ (or) } -\sin 2x$$

$$\frac{dy}{dx} = 3\sin^2 x \cos^2 x - \sin^4 x$$

$$\frac{dy}{dx} = 2 \sec x \tan x + \sec^2 x$$

$$\frac{dy}{dx} = \sec^2 x \sin x \text{ (or) } \sec x \tan x$$

$$\frac{dy}{dx} = 12 \sin 3x \cos 3x \text{ (or) } 6 \sin 6x$$

$$\frac{dy}{dx} = -4 \operatorname{cosec} 4x \cot 4x$$

$$\frac{dy}{dx} = 2 \cot x \operatorname{csc}^2 x (21 - 2 \operatorname{csc}^2 x)$$

$$\frac{dy}{dx} = -6 \sin 3x (1 + \cos 3x)$$

$$\frac{dy}{dx} = \frac{-1}{2} \sin \frac{x}{2}$$

$$\frac{dy}{dx} = 6 \sec 6x \tan 6x$$