

Derivatives with Trigonometric Functions

Learning Objectives

- Find the derivative of a function with sine or cosine
 - Use the product or quotient rule to find a derivative with sine or cosine
 - Use the chain rule with trigonometric functions
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Find the derivative of a function with sine or cosine

1. Find the derivative of the function $f(x) = 3 \sin x - 4 \cos x + 1$.

Use the product or quotient rule to find a derivative with sine or cosine

2. Find the derivative of the following functions.

- a. $g(x) = x \sin(x)$

- b. $h(x) = \frac{\cos x}{x}$

Use the chain rule with trigonometric functions

3. Find the derivative of the following functions.

a. $u(x) = \sin^2(x)$

b. $v(x) = \cos(x^2)$

- $\frac{d}{dx}(\sin x) = \cos x$
- $\frac{d}{dx}(\cos x) = -\sin x$

ANSWER KEY

1. $f'(x) = 3 \cos x + 4 \sin x$

2. a. $g'(x) = \sin x + x \cos x$, b. $h'(x) = \frac{-x \sin x - \cos x}{x^2}$

3. a. $u'(x) = 2 \sin x \cos x$, b. $v'(x) = -2x \sin(x^2)$