

TRIGONOMETRIC FUNCTIONS $\frac{D}{DX} \cos X$:

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

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

Recall that product, quotient and chain rule also apply to trigonometric functions.

Product Rule: $\frac{d}{dx}[f(x)g(x)] = f'(x)g(x) + f(x)g'(x)$

Quotient Rule: $\frac{d}{dx} \left[\frac{f(x)}{g(x)} \right] = \frac{g(x)f'(x) - f(x)g'(x)}{[g(x)]^2}$

Chain Rule: $\frac{d}{dx}[f(g(x))] = f'(g(x))g'(x)$

Common question types:

1. $\frac{d}{dx} A \cos x = -A \sin x$

2. $\frac{d}{dx} A \cos Bx = -AB \sin Bx$

3. $\frac{d}{dx} A \cos^c x = \frac{d}{dx} A(\cos x)^c = -AC(\cos x)^{c-1} \sin x$

4. $\frac{d}{dx} \sec x = \frac{d}{dx} (\cos x)^{-1} = -(\cos x)^{-2}(-\sin x) = \frac{\sin x}{\cos^2 x} = \tan x \sec x$

3.1 WORKED EXAMPLE

Differentiate $34 \cos x$ with respect to x :

3.2 WORKED EXAMPLE

Differentiate $8 \cos 3x + 9 \sin 2x$ with respect to x :