

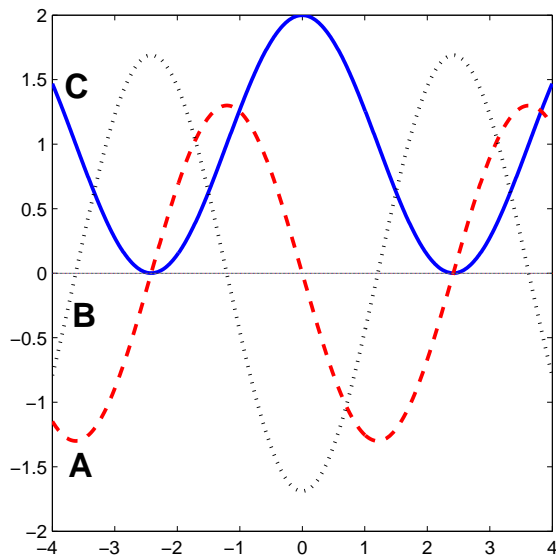
1 3.8: Higher Derivatives

Second derivative: derivative of the first derivative

What the second derivative tells us:

Examples:

Label each of the graphs below as the original function, first derivative, or second derivative.



Given $f(x) = \frac{1}{1+x}$, find a formula for $f^{(n)}(0)$ (the n th derivative at $x = 0$)

Given $x^3 + y^3 = 1$, find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$.

(On your own): Find and simplify the first and second derivatives of $f(x) = \sqrt{x^2 + 1}$

$$f'(x) = \frac{x}{\sqrt{x^2 + 1}}, f''(x) = \frac{1}{(x^2 + 1)^{3/2}}$$