MATH 160 Session #21

Some Notation for the Derivative

Supppose y = f(x).

We denote the derivative of f(x) by f'(x).
Similarly, we denote the derivative of y with respect to x by $\frac{dy}{dx}$.

Asking for the Derivative

Suppose $f(x) = 3x^2 - 4x + 5$. Specify f'(x). _____

Suppose $y = 3x^2 - 4x + 5$. Specify $\frac{dy}{dx}$. _____

Specify $\frac{d}{dx}(3x^2 - 4x + 5)$. _____

Some Special Derivatives

1. $\frac{d}{dx}(32) =$ _____

2. $\frac{d}{dx}(x) =$ _____

3. $\frac{d}{dx}(x^2) =$ _____

4. $\frac{d}{dx}(x^{-1}) =$ _____

5. $\frac{d}{dx}(x^3) =$ _____

6. $\frac{d}{dx}(x^4) =$ _____

Suppose c and r are constants.

7. $\frac{d}{dx}(cx^r) =$ _____

8. $\frac{d}{dx}(ce^x) =$ _____

Suppose $a_0, a_1, a_2, \ldots, a_n$ are constants

9. $\frac{d}{dx}(a_0 + a_1x + a_2x^2 + a_3x^3 + \ldots + a_nx^n) =$ _____

Examples **In each case find f'(x).**

10. $f(x) = 5x^{10}$; f'(x) = _____

11. $f(x) = 4x^3 + 10x$; f'(x) = _____

12. $f(x) = \frac{2}{x^3}$; f'(x) = _____

12. $f(x) = 2\sqrt{x} + 3x$; f'(x) = _____

13. $f(x) = 100e^x$; f'(x) = _____

14. $f(x) = x(x-1)(x+1)$; f'(x) = _____