6.1 - INTRODUCTION TO ANTIDERIVATIVES

I. Antidifferentiation of a given function leads to an entire family of functions.

II. Indefinite Integrals and notation:

III. Rules

1. $\int x^n \, dx = \frac{x^{n+1}}{n+1} + C, \quad n \neq -1$

2. $\int \frac{1}{x} \, dx = \int x^{-1} \, dx = \ln|x| + C$

3. $\int e^x \, dx = e^x + C$

4. $\int kf(x) \, dx = k \int f(x) \, dx$

5. $\int [f(x) \pm g(x)] \, dx = \int f(x) \, dx \pm \int g(x) \, dx$

6. $\int k \, dx = k \cdot x + C$

Examples:

IV. Particular Antiderivatives: Find the equation of the curve that passes through (2,6) and whose slope is $\frac{dy}{dx} = 3x^2$ for any x.

HW 6.1 # 1 – 23 (odd), 35 – 71 (odd)