Math 116: Business Calculus
Chapter 7 - Integration

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Exam 2 - Thursday April 27.

6.1 Absolute Extrema.

6.2 Applications of Extrema.

6.3 Further Applications.

7.1 Anti-derivatives.

7.2 Substitution.

7.3 Area and Definite Integral.

7.4 Three Fundamental Theorems.

7.5 Area between Two Curves.

8.3 Continuous Mondey Flow.

Example 1. Substitution

1. Find $\dfrac{d}{dx}\dfrac{(3x^2+4)^8}{8}$

2. Find $\displaystyle\int 6x(3x^2+4)^7\,dx$

Example 2. Substitution

1. Find $\dfrac{d}{dx}\dfrac{2(x^3+1)^{3/2}}{9}$

2. Find $\displaystyle\int x^2\sqrt{x^3+1}\,dx$

Example 3. Substitution

1. Find $D_x\left[\dfrac{-1}{2(x^2+6x)}\right]$

2. Find $\displaystyle\int \frac{x+3}{x^2+6x)^2}\,dx$

Example 4. Substitution

Find $\int \frac{2x-3}{x^2-3x}\,dx$

Example 5. Substitution

Find $\int x^2 e^{x^2} dx$

Example 7. Substitution

The research department for a hardware chain has determined that at one store the marginal price of x boxes per week of a particular type of nails is

$$p'(x) = \frac{-4000}{(2x+15)^3}$$

Find the demand equation if the weekly demand for this type of nails is 10 boxes when the price of a box of nails is \$4.

Problem 8. Substitution

Find $\int \frac{6x^2}{(2x^3+7)^{3/2}}\,dx$

Problem 42: Homework

The rate of growth of the profit (in millions of dollars) from a new technology is approximated by

$$P'(t) = te^{-t^2}$$

where t represents time measured in years. The total profit in the third year that the new technology is in operation is $\$10,000$.

1. Find the total profit function
2. What heppens to the total amount of profit in the long run?