Math 220 - Calculus f. Business and Management - Worksheet 32

Worksheet 32 - Integration by Substitution

Exercise 1: *Find the derivatives of each of these functions*

$$\textbf{1a)}: f(x) = e^{3x^2+2x} \qquad \textbf{1b)}: \ f(x) = (x^2+3x)^{27}$$

Exercise 2*: Use what you have seen in problem 1 to set up integration by substitution for the following:*

$$\textbf{2a)}: \int (6x+2)e^{3x^2+2x}\,dx \quad \textbf{2b)}: \int 5(2x+3)(x^2+3x)^{26}\,dx$$

Exercise 3*: Solve these integrals using substitution:*

$$\textbf{3a)}: \int (3x+2)^4\,dx \quad \textbf{3b)}: \int t\,e^{3t^2}\,dt \quad \textbf{3c)}: \int 2x\sqrt{5x^2-2}\,dx \quad \textbf{3d)}: \frac{4x^5}{x^6-8}\,dx$$

$$\textbf{3e)}: \int x(x-2)^5\,dx \quad \textbf{3f)}: \int e^{5t}\,dt$$

Exercise 4*: The marginal profit in thousands of dollars as a function of items sold is* $P'(q) = 3q(q^2+2)^2$*. The profit from selling* 30 *items was* $\$10,000.00$*. Find the equation for the total profit.*