Calculus Term 2 Week 4 Homework: More Area-Related Excitement
Due Monday 6 March 2006
Mr. Quinn

Part I: Find the average values of these functions on the indicated interval.

1. $f(x) = 2x - 1$ on x = [2, 5]
2. $f(x) = x^2 + 1$ on x = [1, 7]
3. $f(x) = 4x - x^2 + 6$ on x = [0, 3]
4. $f(x) = x^3 + 11$ on x = [-2, 0]
5. $f(x) = \sin x$ on x = [0, $\frac{p}{2}$]
6. $f(x) = \sqrt{x}$ on x = [0, 16]
7. $f(x) = 2x(3x^2 + 7)$ on x = [1, 2]
8. $f(x) = 3x^5 - 2x^4$ on x = [0, 1]

Part II: Determine these derivatives.

1. $\frac{d}{dx}\int_2^x (6t - 5)\, dt$
2. $\frac{d}{dx}\int_2^{4x} \cos t\, dt$
3. $\frac{d}{dx}\int_7^{2x} (t - 5t^3)\, dt$
4. $\frac{d}{dx}\int_0^{5x^3} 7t\, dt$
5. $\frac{d}{dx}\int_{-1}^{2x^3} (t^2 + 6)\, dt$
6. $\frac{d}{dx}\int_0^{x^2} (\sin 6t + 11)\, dt$

Part III: Evaluate these definite integrals – some of them are all new, but a few aren't. It's all good practice.

1. $\int_0^1 e^{7x} dx$
2. $\int_0^2 4x^2(8 + 3x^3)\, dx$
3. $\int_1^2 xe^{3x^2+1}\, dx$
4. $\int_2^6 -x^2 + 8x - 2\, dx$
5. $\int_0^1 \frac{x}{x^2 + 1} dx$
6. $\int_2^3 \frac{4}{x + 3} dx$