Dawson College: Calculus II: 201-203-DW Section 04

Practice Problems

Remember to practice using correct notation!

1. Find the indefinite integral:

a) $\int (3x^2 - \sin x)\, dx$ **b)** $\int \frac{(\sqrt{x}+2)^2}{x} dx$ **c)** $\int 3x\cos(2x^2+1)dx$

d) $\int \left(6x - \frac{2}{x^3} - 5\right) dx$ **e)** $\int (x^4 - 6x)^5 (2x^3 - 3)dx$ **f)** $\int (2x^2 + xe^{5x^2+1})dx$

g) $\int (e^x - x^e)dx$ **h)** $\int (x-3)(x+1)^4 dx$ **i)** $\int \sin x \cos(\cos x)dx$

j) $\int \frac{1+ln(5x)}{x} dx$

2. Solve the initial value problems:

a) $f'(x) = 3\sqrt{x} - \frac{1}{\sqrt{x}},\ f(1) = 6$ **b)** $f'(x) = e^x - 2x,\ f(0) = 2$

3. Find f if the slope of the tangent line is given by $f'(x) = t^2 - 2t + 3$ and f passes through the point $(2, \sqrt{2})$.

4. Page 405 #67-70.

5. Use the definition of the definite integral (Riemann sum) to evaluate the each of the following definite integrals:

a) $\int_1^3 (1+2x)dx$ **b)** $\int_0^5 (3x^2+5x-1)dx$ **c)** $\int_2^4 (x^3+1)dx$

6. Evaluate the definite integral:

a) $\int_1^2 (x-4)(x-2)dx$ **b)** $\int_0^2 (t^2-1)^2 dt$ **c)** $\int_4^9 \frac{1}{\sqrt{2x+1}} dx$

d) $\int_0^4 x\sqrt{x+1}dx$ **e)** $\int_1^2 \frac{3u^3 - 2u^2 + 4u}{u^2} du$ **f)** $\int_{-1}^1 x^2(2x^3+1)^3 dx$

7. Page 438 #41-43 (Use the **net change** formula)

8. Find the average of the function f over the indicated interval $[a, b]$:

a) $f(x) = 8 - x,\ [1,4]$ **b)** $f(x) = 3x^2 - 2x + 1,\ [0,1]$ **c)** $f(x) = xe^{x^2},\ [0,2]$