Math1210 Midterm 3 Extra Review

1. Evaluate

(a) $\int \left(2x^4(x^5-1)^{-2/3}\right)dx$

(b) $\int \left(3\sqrt[5]{t}-\frac{4}{t^2}+2t^3-\sin t+10\right)dt$

(c) $\int \frac{(2x+3)^2}{\sqrt{x}}dx$

(d) $\int (4x^5-\cos x+\sqrt[3]{x^2})\,dx$

(e) $\int \frac{4x}{\sqrt{x^2-3}}dx$

(f) $\int (2x^3\sqrt{2x^4+3})\,dx$

2. Solve the following differential equation.

$$\frac{dy}{dx}=\frac{4x^3+\frac{1}{x^2}}{3y^4} \quad \text{such that} \quad y=-1 \quad \text{when} \quad x=1$$

3. For the function $f(x)=\frac{3x-2}{x-5}$ on the closed interval [1, 4], decide whether or not the Mean Value Theorem for Derivatives applies. If it does, find all possible values of c. If not, then state the reason.

4. Solve $x^4-53=0$ using Newton's Method, accurate to four decimal places.

5. For $f(x)=3x^2+4x-1$ on [0, 2], decide whether or not the Mean Value Theorem (for Derivatives) applies. If it does, find all possible values of c. If not, then state the reason.

6. Solve this equation using (A) the Bisection Method **and** (B) Newton's Method to three decimal places.

$f(x)=2x^3-4x+1=0$ On [0, 1]

7. Solve this differential equation.

$\frac{dy}{dx}=\frac{x+3x^2}{y^2}$ and $y=2$ when $x=0$

8. Evaluate $\sum_{i=1}^{10}[(i-2)(2i+5)]$

9. Evaluate the definite integral **using the definition** (the tedious way).

$\int_{-1}^{2}(5x-1)\,dx$.

10. Evaluate $\sum_{i=1}^{10}[(3i-4)(i+5)]$

11. Evaluate the definite integral **using the definition** (the tedious way). $\int_{0}^{3}(4x^2-1)\,dx$.