MAT 1308 B

Assignment 3, due date March, 29 2011

Name.....

Question 1. Find $\frac{dy}{dx}$ if it is given that $y^2 + x\sqrt{y} - x^{2/3} = 1$. Then find the equation of the tangent line to the graph of $y(x)$ at $(1, 1)$.

WORK:

Question 2. Find the absolute maximum and absolute minimum of the function $f : [0, 3] \mapsto \mathbf{R}$ where $f(x) = x^3 - 2x^2 + 4 - 4x$.

WORK:

Question 3. Find the following integrals: (a) $\int (3x^2 - \frac{1}{2}x)\, dx$
(b) $\int (-\frac{1}{2x^2} + \frac{1}{4}x^{\frac{2}{3}})\, dx$
(c) $\int (2x - 1)(\sqrt{x} + 2)\, dx$
WORK:

Question 4. Find the following definite integrals given that $f(x) = \begin{cases} x^2 + 1, \, x \leq 1 \\ \sqrt{x+3}, \, x > 1 \end{cases}$

(a) $\int_0^1 \sqrt{2x} \, dx$

(b) $\int_3^2 x(x+1) \, dx$

(c) $\int_{-1}^2 f(x) \, dx$

WORK:

Question 5. Find the following integrals: (a)$\int \frac{(x^2+1)^2}{x^{\frac{2}{3}}}\,dx$
(b)$\int_0^2 |x^2-1|\,dx$
(c) $\int_{2\sqrt{2}}^3 2x(x^2-8)^6\,dx$
(d) $\int x^2\sqrt{x^3+1}\,dx$
Using substitution and/or integration by parts find
(e) $\int \sqrt{x}\ln(\sqrt{x})\,dx$
WORK: