Calculus II, Exam II, Spring 2012

Name:_____

Student signature:_____

Show all your work and give reasons for your answers. Good luck!

Part I

Each problem in part I is worth 5 points; Show your work!!

Evaluate the following integrals

(1) $\int_0^1 x^3 e^{x^4+3}\,dx$

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

(3) $\int \sin^2(x)\,dx$

(4) $\int x\sin(x)\,dx$

(5) $\int \frac{x}{(x-2)^2}\,dx$

(6) $\int \frac{\sin(x)}{\cos^2(x)+1}\,dx$

(7) $\int \tan(x)\,dx$

(8) $\int \frac{1}{\sqrt{1-x^2}}\,dx$

(9) If $F(x) = \int_x^1 e^{t^2}\,dt$ find $F'(x)$.

(10) Approximate $\int_0^1 e^{x^2}\,dx$ using a Riemann sum with 3 terms and the midpoint rule.

Part II

Credit for each problem as indicated. Justify all your work for full credit!!

Evaluate the following integrals.

15 pts. $\int_0^1 \arctan(x)\,dx$

15 pts. Find the displacement **and** the total distance traveled of a particle whose velocity is given by $v(t) = t^2 - 1$ for $-1 \leq t \leq 2$.

20 pts. Evaluate $\int \frac{x+2}{x^3+2x^2+x}\,dx$

Scratch paper