EXAM 2 - MATH 152 YOUR NAME:

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. How much work is needed to lift a 5m chain over the side of a building if the chain has linear density ρ kg/m and the acceleration of gravity is g m/sec²? (Please do not plug in numbers for ρ and g.)



2. Evaluate the integral

 $\int x \cos^3{(x^2)} dx.$

3. Use trigonometric substitution to evaluate the integral

$$\int \frac{dx}{(x^2+4)^2}.$$

4. Compute the improper integral $\int_{-\infty}^{0} x e^{-x^2} dx$. (Please, show each of the two steps required separately.)

5. Evaluate the integral

$$\int \frac{3x^2 + x + 1}{x^3 + x} dx.$$