## EXAM 4 - MATH 112 DATE: Friday, April 9 INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Use integration by substitution to evaluate the integrals:

(a) 
$$\int \frac{2x^2 - 4}{x^3 - 6x + 11} dx$$
  
(b)  $\int (6x - \frac{15}{2})e^{2x^2 - 5x} dx$ 

- 2. Use integration by parts to evaluate the following integrals:
  - (a)  $\int \frac{1}{x^{2005}} \ln x \, dx$
  - (b)  $\int x^2 e^{7x} dx$
- 3. Compute the definite integrals:
  - (a)  $\int_{-1}^{2} (3x^2 x + 7) dx$
  - (b)  $\int_1^e \ln x \, dx$
  - (c)  $\int_{-1}^{1} 3x e^{2x} dx$
- 4. Make a sketch and find the area of the region trapped by the graphs of  $f(x) = x^3$  and  $g(x) = x^2$ .
- 5. Make a sketch and find the volume of the solid created by revolving the graph of  $f(x) = \sqrt{x+3}, -3 \le x \le 1$ , around the x-axis.
- 6. Make a sketch and find the volume of the solid created by revolving the area trapped by the graphs of  $f(x) = \sqrt{x}$  and  $g(x) = \frac{1}{8}x^2$  around the x-axis.