EXAM 4 - MATH 112

DATE: Tuesday, November 22
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. Compute the indefinite integrals:
   (a) $\int \frac{x^3+x-3}{x} dx$
   (b) $\int (3x+1)(x^2+\frac{2}{3}x)^5 dx$
2. Compute the integrals:
   (a) $\int 3xe^{-(x^2+5)} dx$
   (b) $\int \frac{2}{1+e^{3x}} dx$
3. The graph of the function $f(x) = \frac{x}{(x+3)^3}$ lies above the x-axis in the interval $[0, 3]$. Find the area of the region of the plane that lies between the graph of f and the x-axis and the lines $x = 0$ and $x = 3$.
4. Find the area of the region bounded by the graphs of $f(x) = -x^2 + 4x + 4$, $g(x) = x$.
5. Find the volume of the solid of revolution formed by revolving the graph of $f(x) = xe^x$, $0 \leq x \leq 1$, around the x-axis.
6. Compute the definite integral $\int_2^4 \frac{x^4-4}{x^2-1} dx$.