MATH 1120 **Test 3** **Summer 2001**

Name : _____

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1. Find the following indefinite integrals:

   (a) $\int(4x^3+1)dx$

   (b) $\int(5e^x+\frac{6}{x})dx$

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

   (d) $\int\frac{x}{4x^2-5}dx$

   (e) $\int xe^{x^2+2}dx$

   (f) $\int\frac{(\ln x)^3}{x}dx$

2. Find the following definite integrals:

   (a) $\int_0^2 (3x^2 + 6x + 7)dx$

   (b) $\int_0^1 x^2 e^{2x^3+1} dx$

   (c) $\int_1^3 \frac{x^2}{x^3+1} dx$

3. Suppose that the daily fixed cost of a company is \$400 and that its daily marginal cost function is $C'(x) = -0.25x + 40,\ 0 \leq x \leq 160$, where $C'(x)$ is measured in dollars/unit and x denotes the number of units produced. Find the cost function of the company.

4. Find the area of the region bounded by the graphs of the functions $f(x) = e^{2x}$ and $g(x) = x$ and the vertical lines $x = -1$ and $x = 2$.

5. Find the the area of the region completely enclosed by the graphs of the given functios $f = x + 2$ and $g = x^2 - 4$.

6. The temperature (in $^\circ F$) in Charlotte over a 12-hr period on a certain August day was given by

$$T = 75 + 0.25t\sqrt{144 - t^2}, \qquad (0 \leq t \leq 12),$$

where t is measured in hours, with $t = 0$ corresponding to 9 a.m. Determine the average temperature on that day over the 12-hr period from 9 a.m. to 9 p.m.