DATE: _____

Extra Practice for Chapter 5 Test

1. Let f be a function such that $\int f(x)e^x dx = f(x)e^x - \int 4x^3 e^x dx$. Find $f(x)$.

2. If $f(0) = 6$, $f(1) = 3$, $g(0) = 1$, $g(1) = -1$, and $\int_0^1 f'(x)g(x)dx = 4$, find $\int_0^1 f(x)g'(x)\ dx$

3. Let f be the function defined for $x > 0$, with $f(e) = 2$ and f', the first derivative of f, given by $f'(x) = x^2 \ln x$. Find $f(x)$.

4. Concert tickets went on sale at noon ($t = 0$) and were sold out within 9 hours. The number of people waiting in line to purchase tickets at time t is modeled by a twice-differentiable function, $L(t) = -0.4x^4 + 6.4x^3 - 36.4x^2 + 74.8x + 118$, for $0 \le t \le 9$. Find the average number of people waiting in line during the first 5 hours that tickets were on sale.

5. Evaluate: $\frac{d}{dx}\left(\int_0^{x^2} cos(t^3)\right) dt$

6. If $f'(x) = \frac{10x}{x^2+x-6}$, find $f(x)$.