Review Problems for Math 135 Final Exam

1. Without using the fundamental theorem of calculus, compute $\int_0^5 (2x+4)\,dx$ and $\int_{-2}^5 (x-2)\,dx$.
2. Compute $\int \cos(x)\tan(x)dx$
3. Compute $\int \sin(x^3-2)x^2dx$
4. Compute $\int_0^1 x\sqrt{x+1}dx$.
5. Let $F(x) = \int_1^{2x} \sin^2(x)$. Find and identify all critical points of $F(x)$ on $[0,\pi]$.
6. Let k be a positive constant. Compute $\lim_{x\to 0} \dfrac{e^x-1}{\sin(kx)}$ in terms of k.
7. A function, $f(x)$ has the following properties. Its second deriviative is a positive constant function. What type of function is $f(x)$? What is $\lim_{x\to\infty} f(x)$?
8. Let $y = x^{\tan(2x)}$. Compute $\dfrac{dy}{dx}$.
9. Compute $\int_{-10}^{10} x^{2n+1}dx$ where n is a positive integer.
10. Find the area bounded by the curve $y = x^2 - 7x + 10$ and the x-axis.
11. Let the cost of producing x computers be given by $C(x) = x^2+32x+1600$. The manufacturer intends to sell the computers for \$2000 each. How many computers should be produced to minimize average cost?
12. Consider the curve $y^3x^2 - x\sin(x) + y^5 = 0$. Find $\dfrac{dy}{dx}$.