Name:_____

MA 2320 Quiz 2

1. Compute the following antiderivatives.
   (a) $\int x^2 + 1\,dx$
   (b) $\int 3\sec^2(x) - \frac{4}{x}\,dx$
   (c) $\int \sec(x)\tan(x) + 2e^x\,dx$
   (d) $\int 2\sqrt{x} - 2 + \frac{4}{x^2}\,dx$
   (e) $\int \frac{3}{1+x^2}\,dx$
2. Compute the following definite integral (using the fundamental theorm of Calculus).
   (a) $\int_0^1 x^2 + 1\,dx$
   (b) $\int_0^{\pi/4} \cos(x)\,dx$
3. Compute the average value of the following.
   (a) $f(x) = \frac{1}{x}$ over the interval $[1, e]$.
   (b) $f(x) = x^n$ over the interval $[0, 1]$ for any positive integer n.
4. If the Mean Value theorem applies, compute the points at which the function equals its average value. If Mean Value theorem does not apply state why.
   (a) $f(x) = 8 - 2x$ over the interval $[0, 4]$.
   (b) $f(x) = 1 - |x|$ over the interval $[-1, 1]$.
5. Compute the following indefinite integrals using substitution.
   (a) $\int x\sqrt{x^2 + 1}\,dx$
   (b) $\int x^3(x^4 - 7)^9\,dx$
   (c) $\int x\sec(x^2 + 1)\tan(x^2 + 1)\,dx$
   (d) $\int \frac{e^x}{1+e^x}\,dx$ Hint: let $u = 1 + e^x$
   (e) $\int \frac{e^x}{1+e^{2x}}\,dx$ Hint: let $u = e^x$