Math 113 Exam #3 Practice Problems

1. Determine the absolute maximum and minimum values of the function
$$f(x) = \frac{x}{1+x^2}.$$

2. A specialty publisher has typically sold trade paperbacks for \$15, averaging 300 sales per week. The publisher has found that increasing the price by 50 cents reduces sales by 10 per week. If the books cost \$10 each to make, what price should the publisher charge to maximize profit?

3. Find the inflection points for the function
$$f(x) = 8x + 3 - 2\sin x, \quad 0 < x < 3\pi.$$

4. Evaluate the limit
$$\lim_{x \to 0^+} x^2 \csc^2 x.$$

5. Given that
$$f'(t) = 2t - 3\sin t, \quad f(0) = 5,$$
find f.

6. Find the absolute minimum value of the function
$$f(x) = \frac{e^x}{x}$$
for $x > 0$.

7. Evaluate the integral
$$\int \sec 3t \tan 3t dt.$$