PHILADELPHIA UNIVERSITY

DEPARTMENT OF BASIC SCIENCES

Midterm Exam   **Numerical Analysis**   **05–12–2012**

1. Use the bisection method to find p_3, an approximation to $f(x) = 0$ on the interval $[3.2, 4]$.
$$f(x) = x^3 - 7x^2 + 14x - 6$$

2. Refering to the previous problem, how many iterations are needed for the approximation p_N to be accurate within 10^{-7}?

3. Use the fixed-point method to find p_2, an approximation to $f(x) = x$, given that $p_0 = 0.25$.
$$f(x) = \sqrt{\frac{e^x}{3}}$$

4. Use Newton's method to find p_2, an approximation to $f(x) = 0$, given that $p_0 = 1$.
$$f(x) = \sin x - e^{-x}$$

5. Repeat the previous problem, this time using the Newton-Raphson method.

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