

Name : _____ Partners : _____

INSTRUCTIONS :

1. Write the names of you and your partners.
 2. Write all intermediate steps, and circle the answers.
 3. Answers given without sufficient work to support them may NOT receive credit.
 4. Every member of a group should turn in the lab report stapled with this paper on top.
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1. Do #11 on page 52.
 2. Do #29 on page 53.
 3. Do #3 on page 60.
 4. Do #15 on page 61.
 5. Find the number, n of steps that should be taken in the bisection method to guarantee that the root is determined with *relative* error at most ϵ , if the initial interval is $[a_0, b_0]$ with $a_0 > 0$.
 6. Explain why Newton's method fails when applied to the equation $\sqrt[3]{x} = 0$ with any initial approximation $x_1 \neq 0$. Illustrate your explanation with a graph.
 7. Consider a sequence $\{x_n\}$ generated by the Newton's method applied to the equation $\tan^{-1}(x) = 0$.
 - (a) Show that if $x_0 \neq 0$, then $x_{n+1}x_n < 0$ for all $n \geq 0$.
 - (b) Find a condition on x_n for which $|x_{n+1}| < |x_n|$.
 - (c) Use (b) to find a condition on the initial guess x_0 for which the Newton's method converges.