Math 131 - Ex Cred

April 23, 2020

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. You must work individually on this assignment. The assignment is due no later than April 28.

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1. (2 points) Use Newton's method, starting with $x_0 = -1$, to approximate the solution of the equation $x = \cos x$. Which one of these numbers is closest to your value of x_2? (Show work for credit.)

   (a) 0.75

   (b) 2.98

   (c) 8.72

   (d) -0.51

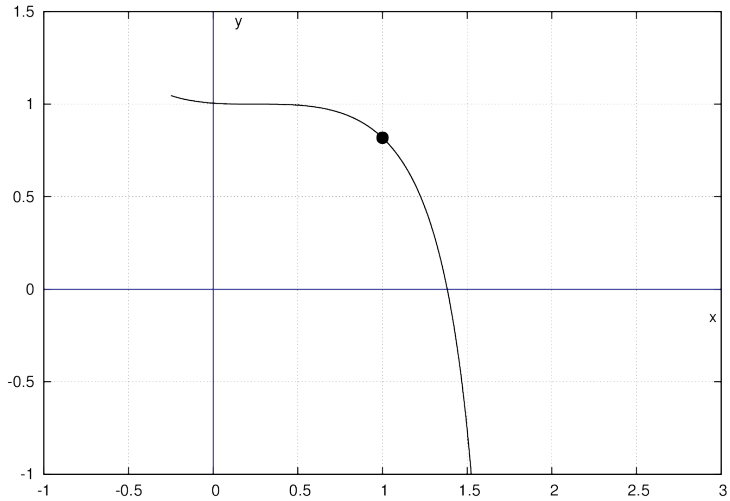
2. (1 point) The graph of $y = f(x)$ is shown below. Suppose you use Newton's method, starting with $x_0 = 1$, to approximate a solution of $f(x) = 0$. Which one of the following numbers would be closest to x_1? (Explain or show work.)

   (a) 1.9

   (b) 1.35

   (c) 2.5

   (d) 1.0



3. (3 points) Consider the function $f(x) = x^3 - 16x + 32$, and suppose you wish to find a solution of $f(x) = 0$.

   (a) Use Newton's method starting with $x_0 = 2$. Take several steps. What do you notice?

   (b) Use Newton's method with a better initial guess. Take enough steps to determine the solution with several digits of accuracy.