

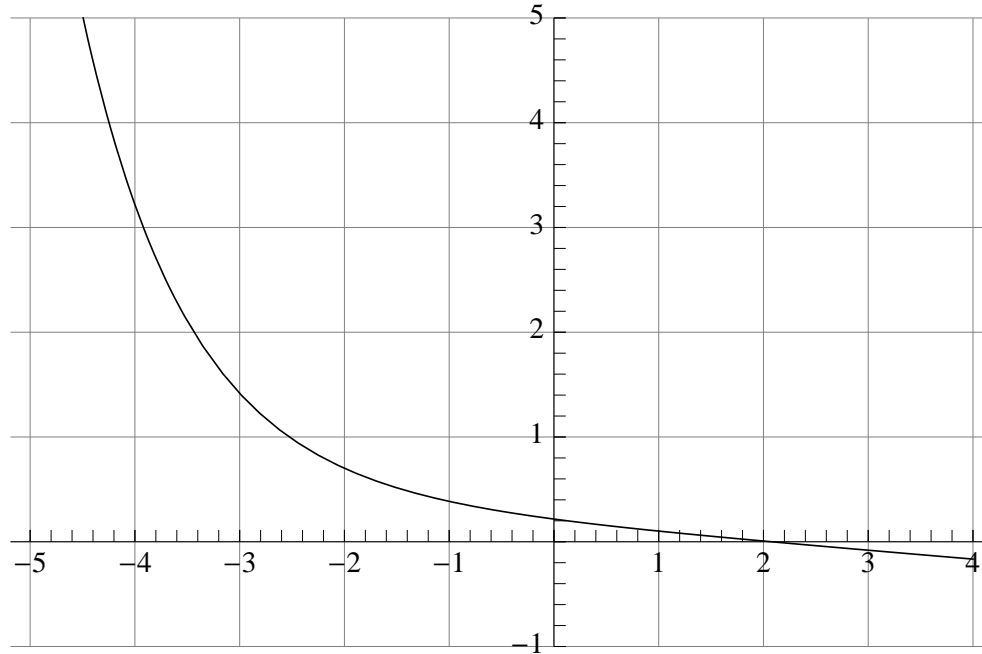
MATH 251 (PHILLIPS): WRITTEN HOMEWORK 10.

This sheet is part of the homework for Week 10, and is due in class on Friday 1 December 2017.

All the requirements in the sheet on general instructions for homework apply. In particular, show your work (unlike WeBWorK), give exact answers (not decimal approximations; again, unlike WeBWorK), and use correct notation. Some of the grade will be based on correctness of notation in the work shown.

Write your answers on a separate sheet of paper, except for the problem which tells you to draw on the graph.

1. The picture below shows the graph of a function f . Suppose that Newton's method is used to approximate the root of the equation $f(x) = 0$ which is visible in the picture, with initial approximation $x_1 = -4$. Draw on the graph the tangent lines that are used to find x_2 and x_3 , and estimate the numerical values of x_2 and x_3 .



2. Using the bisection method with the initial interval $[2, 3]$, find the next three approximations to $\sqrt{7}$. Be sure to check that the method applies with this choice of initial interval. Give exact answers, and, as usual, simplify completely and do not use mixed fractions.
3. Find a recursive formula which approximates $\sqrt[6]{11}$ using Newton's method.
4. Let $h(x) = \frac{\arcsin(x^2 - 3x)}{\ln(8x + \sqrt{7})}$. Find $h'(x)$.
5. Let $h(x) = 37e^2 - x \arcsin(x^2 - 3x)$. Find $h'(x)$.