

Individual Homework #3: Due September 28, 2016

Please **read** the subsection “The circular functions” starting at the bottom of page 40; also **read** Sections 3.3 and 3.5.

Please **do** exercises 10 and 11, page 42; as well as exercises 2ab, 10ab, 11bcd, 13ad, 14acd, 15, pages 130–135; as well as exercises 6, 8, 13, 15, 17, 18, 20, pages 153–156.

Some notes on the homework:

1. Do all graphs using MATLAB, and remember to label your axes and appropriately.
Recall that, when the text says “to two decimal place accuracy,” they mean “so that there’s uncertainty at worst in the third decimal place.” (See the discussion in exercise 9, page 40.) So for example, in exercise 10a page 42, if you zoom in on the graph of $\sin(x)$ closely enough to see that it intersects the x axis somewhere between $x = 3.141$ and $x = 3.142$, then you’ve found an x -intercept of $f(x) = \sin(x)$ to two decimal place accuracy (and you can write: “ $y = \sin(x)$ intersects the x axis at 3.14...” Note the “...” to indicate that the decimal expansion continues).
Finally: for each of the exercises on page 42, please supply, with your homework, the graph requested. (You only need to supply the overall graph requested at the beginning of each exercise; you needn’t supply any zoomed in graphs you used to answer other parts of the exercise.)
2. **Exercise 2ab, page 130:** use only the FIRST method requested (the “computer microscope” method); ignore the second method. Also, please print out, and include with your HW, the MATLAB graph you used to answer each part of this question. That is: for each part of this exercise, supply a graph that’s sufficiently zoomed in, near the point in question, that the graph looks linear there. Also, show the computations you used to find the requested slope at this point.
3. In ANY exercise where it says “write the microscope equation,” this means version 2, as discussed in class: $f(a + \Delta x) \approx f(a) + f'(a)\Delta x$, for the particular f and a specified in the exercise.
4. **Exercise 10ab, page 133:** For the required values of $f'(a)$ here, use the slopes you found in exercise 2, page 130 above (even if you know other ways of finding these derivatives).
5. **Exercise 15, page 134:** Please EXPLAIN how you got your answer, and what it has to do with the microscope equation.
6. When asked to find derivatives, in Section 3.5, you may USE THE FORMULAS AND RULES from Section 3.5; you don’t need to compute these derivatives by taking LIMITS.