

GENERAL INSTRUCTIONS FOR HOMEWORK AND EXAMS

This sheet gives general instructions for written homework in N. C. Phillips' classes with numbers less than 300. The examples in it are taken from Math 112, but similar examples could be provided for any other course. Much of what is here is standard, but some is not, so please read through it once. Except where obviously in applicable, these instructions also apply to all exams.

- (1) Homework will be submitted via Canvas. The following instructions apply to *all* electronically submitted files, whether homework, exams, or anything else, and whether via email, Canvas, or any other method.
 - All submissions must be as a single file.
 - The only file formats accepted are **.pdf**, **.ps**, standard image formats (such as **.jpg**), and **T_EX** or its standard extensions (such as **L^AT_EX**). In particular, Microsoft Word, PowerPoint, and Excel files are **not** accepted.
 - Files made by scanning must have good enough resolution that I can read them easily. (Somebody once submitted a scan whose resolution was so bad as to give less than 50 pixels per character.)
 - Scanned files should show dark writing on a light background. (Dark on dark is hard to read, and hard to write comments on.)
 - Files should be black and white. I work from printed copies, and don't have a color printer.
 - Apart from the extension (such as **".pdf"**), your file name should contain only numbers, capital and lowercase letters, and underscores. In particular, **no** spaces or parentheses. (This restriction is for compatibility with my computer system. Some scanning programs, such as CamScanner, generate unacceptable file names, and you will need to change the file name before submitting it.)
 - You do not need to put any identifying information in the file name; a file name like **"HW3.pdf"** is quite sufficient. (The Canvas system adds enough identifying information.)
 - Write your name on *every* page. I work from printed copies, and the file name does not appear anywhere on any page of the printed copy.
- (2) You are encouraged to work together on homework to understand the material and understand how to do the problems. However, you must turn in your own assignment; you may not simply copy from someone else's paper or from the back of the book. If you work together with others, you **must** write on the top right of your paper (below your own name) the names of any other people you worked with on the assignment. Under no circumstances may you communicate with anyone else (except the course instructor) on any exam.
- (3) The grader has less than 5 minutes per week per student. Therefore it is important to write neatly, put the problems on your paper in the same order that they appear in the assignment (even if you don't do them in that order), and start all problems at the left margin of the paper.
- (4) *Final answers must always be simplified unless otherwise stated.* This means that common factors must be cancelled from fractions, terms containing common factors must be combined, like terms in polynomials must be combined, constants must be combined, expressions like $\sin(0)$, e^0 , $\ln(1)$, etc. must be evaluated, etc. It does **not** mean that denominators must be rationalized, that products must be multiplied out (often the factored form is simpler), or that numerical expressions must be evaluated using the calculator.

Here are some examples of expressions that must be simplified:

$$\ln(e^x), \sin(\pi/2), \frac{2x+4}{x+2}, \frac{2x^3}{x^4}, x^2+3x^2, 2(x+6)+x(x+6)$$

Here are some examples of expressions that may be left as they are:

$$\frac{1}{\sqrt{2}}, (x-2)(x+5), e^{1/2}, 5700 \cdot e^{\frac{27}{10} \ln(\frac{130}{57})}$$

- (5) *Show your work* (but don't turn in scratchwork).
- (6) *Your work should be mathematically correct and use correct notation, for the same reason that assignments in a writing class should use correct words, spelling, and grammar.* (Also note that computers and calculators are very picky about notation.) It should also include enough words to explain what you are doing. You are trying to communicate something (we are, after all, giving partial credit if some of your work is correct), so you should ensure that what you say is what you mean. There is a lot more in separate files on notation, but here are some of the most common issues.

Consider the following solutions to the problem of finding $\log_2(1/8)$:

Good:

$$\text{Let } x = \log_2(1/8). \text{ Then } 2^x = 1/8. \text{ So } x = -3.$$

Fair:

$$\log_2(1/8) = x \implies 2^x = 1/8 \implies x = -3.$$

Poor:

$$\log_2(1/8) \implies 2^x = 1/8 \implies x = -3.$$

Poor:

$$\log_2(1/8), \quad 2^x = 1/8, \quad x = -3.$$

Wrong:

$$\log_2(1/8) = 2^x = 1/8 = x = -3.$$

The first is what the solution should look like. The second is also acceptable. The third and fourth are not very good, because the third does not say what x is, and the fourth does not say how the steps are related. The fifth contains a number of **false** statements (for example, $1/8$ is certainly not equal to -3), and will be penalized accordingly.

Here are some other common errors.

- The parentheses in the following expressions are *required*; the expression is wrong (or changes its meaning) if they are left out:

$$2 \cdot (-x), \quad a(b+c), \quad a - (b+c), \quad 1/(2+x), \quad (2+x)/7.$$

In particular, in fractions, parentheses are required except when the fraction line is exactly horizontal.

- Use of mixed fractions: $2\frac{1}{2}$ will be read as $2 \cdot \frac{1}{2} = 1$, not $2 + \frac{1}{2}$. Write $2 + \frac{1}{2}$ if that is what you mean.
 - Use of \times as a multiplication symbol. In handwritten work, it is too easily read as x .
- (7) On graphs, label the axes, give some indication of the scale on each axis, label the x and y intercepts whenever it is clear what they are, and label the curves if there is more than one. If the problem says to plot the graph by hand, give some indication of what points you used (such as a small table).
- (8) Use correct units. If the correct answer is 1.37 months, then an answer of 1.37 years is wrong, and will be graded as wrong. If the problem asks for the population of a city, then an answer of 2.7 million years is certainly wrong, and will be graded as wrong.
- (9) Give calculator approximations to at least 3 significant digits, and don't round intermediate results. (All calculators have memories, so you don't have to reenter intermediate results.)
- (10) If you use a result from a problem you already did, say where you got it. (When I grade a problem on your paper, I don't look at anything else on your paper: I have been looking at other people's solutions to the same problem I am grading on your paper.)
- (11) If a problem says to do something with your calculator, show what you got. (No credit will be given for the answer "done".)