

General instructions for homework and exams

This sheet gives general instructions for 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 inapplicable, these instructions also apply to all exams.

1. You are encouraged to work together 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.

2. If you want to write notes on your homework paper about problems gone over in class before turning it in, make sure to use a different color (or ink instead of pencil, or vice versa), and indicate which work is yours and which is from class. An even better alternative is to keep a xerox copy and write your notes on that. It is not acceptable to submit for credit work you copy off the board when I answer questions on homework. If you want to use your homework to study for an upcoming exam or quiz, please copy it before turning it in. (Homework graders often take a week or even more to return homework.)

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. All homework papers must be on standard $8\frac{1}{2} \times 11$ inch paper. (I do not mind if homework is done on the back of good quality paper that has been used on one side.) If you use more than one page, your pages must be stapled together. Do **not** fold or tear the corners. Do **not** fold the papers in half lengthwise.

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. Since the graders have so little time (they are not paid enough), they usually do not grade every problem. Depending on the style of the grader, you may get significant comments on a few problems, or much less informative marks on more (but not all) problems.

6. *Show your work* (but don't turn in scratchwork).

(Continued on back or on next page.)

7. Your work should be mathematically correct, for the same reason that assignments in a writing class should use correct 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.

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.

Writing two operation symbols next to each other. Standard conventions don't allow expressions like $2 + -7$ or $2 \cdot -x$. Use parentheses.

Use of \times as a multiplication symbol. In handwritten work, it is too easily read as x .

8. 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).

9. 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.

10. 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.)

11. If you use a result from a problem you already did, say where you got it.

12. If a problem says to do something with your calculator, show what you got. (No credit will be given for the answer "done".)