

# HANDOUT ON HOW TO WRITE UP A HOMEWORK PROBLEM

## General Comments

- ① Often good to state the problem
  - ② Show work: don't just have equations scattered all over the page without connecting phrases. If you make a mistake, cross out if you can.
  - ③ make sure it is clear what your answer is, and where it is on the page
  - ④ try to be neat and do the problems in order
- And, of course, write your name clearly, state the class and section.

Section 1.2) #5) Find the equation of the line  $L$  passing thru  $(2, -3)$  and  ~~$(2, -3)$~~   $(5, 3)$

Soln: We will use point-slope

$$\text{Slope} = \frac{\Delta y}{\Delta x} = \frac{\cancel{5} - \cancel{(-3)}}{\cancel{3} - 2} = \frac{3 - (-3)}{5 - 2} = \frac{6}{3} = 2$$

Equation of a line with slope  $m$  going thru  $(x_1, y_1)$  is  ~~$y - y_1 = m(x - x_1)$~~   $y - y_1 = m(x - x_1)$

So slope = 2, point =  $(5, 3)$

Thus eq of the line is  $y - 3 = 2(x - 5)$

Section 3.2) #1) Find the derivative of  $f(x) = 3x^2 - x + 5$

Soln:  ~~$f(x) = 3x^2 - x + 5$~~  ~~maximize~~ ~~minimize~~ ~~differentiate~~

$$f(x) = 3x^2 - x + 5$$

$$f'(x) = (3x^2)' - (x)' + (5)'$$

sum-difference rule

$$= 3(x^2)' - (x)' + (5)'$$

constant rule

$$= 3 \cdot 2x - 1 + 0$$

table of derivatives

$$\underline{f'(x) = 6x - 1}$$

Extra Problem: Given  $f(x) = 2x + 3$  and  $g(x) = x^2 + 1$ , find  $f(g(x))$  and  $g(f(x))$

$$\begin{aligned}\text{Soln: } f(g(x)) &= 2g(x) + 3 \\ &= 2(x^2 + 1) + 3 \\ &= 2x^2 + 2 + 3 \\ \underline{\underline{f(g(x))}} &= \underline{\underline{2x^2 + 5}}\end{aligned}$$

$$\begin{aligned}g(f(x)) &= (f(x))^2 + 1 \\ &= (2x + 3)^2 + 1 \\ &= 4x^2 + 12x + 9 + 1 \\ \underline{\underline{g(f(x))}} &= \underline{\underline{4x^2 + 12x + 10}}\end{aligned}$$

### Concluding remarks

You don't need to use three colors, you don't need to state all the reasons behind the steps (especially if they are simple), but the HW should be easy to read and follow. It is possible to get the right answer with incorrect logic, which is why it is so important that you show your work. I deliberately made some mistakes, but as there was plenty of room to write the correct answer after crossing it out, I just did that - the HW is still neat and readable, and it is clear where the answers are.