

## WRITTEN ASSIGNMENT 2.1

Due date: Friday, Jan 12, 2018 (in class)

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*Hand in full solutions to the questions below. Make sure you justify all your work and include complete arguments and explanations. Your answers must be clear and neatly written, as well as legible (no tiny drawings or micro-handwriting please!). Your answers must be stapled, with your name and student number at the top of each page.*

1. In this question, you will be reviewing your December exam and reflect on your errors. Solutions to some of the questions from the December exam are posted at

[http://www.math.ubc.ca/~costanza/m110/ex-dec\\_sol.pdf](http://www.math.ubc.ca/~costanza/m110/ex-dec_sol.pdf)

(Exams were returned in class, talk to your instructor if you haven't picked up your exam yet).

(a) Review solutions to Question 1 and 4 of the December exam, then compare them with your answers on the exam. If your answers are incorrect, explain why. Make sure you explain what key concept(s)/skill(s) the question was testing and how you would correct your work. Your answers should include explanations and, if needed, some calculations, but there is no need to reproduce a full solution. Imagine the reader is a fellow student in your class who doesn't know how to answer the problem and needs detailed explanations on the concepts and techniques required to tackle the problem in question.

If you scored at least 85% on either one of these questions, pick two other questions where you made some significant mistakes and comment on your errors.

(b) Redo question 7 and 9 of the exam. If you need help getting started on these questions, you should look at your past midterm exam (the October exam) or past homework, quizzes or class notes.

2. Here you need to construct a mathematical argument to show, using implicit differentiation, that the tangent line at any point  $P$  to a circle with centre at the origin  $O$  is perpendicular to the radius  $OP$ .

*Hint:* The equation of a circle centred at the origin with radius  $r$  is  $x^2 + y^2 = r^2$ . Consider a point  $P(x, y)$  on the circle and find the slope of the tangent line to the circle at that point. Then think about the segment  $OP$  from the origin to  $P$ , what's its slope?