Comments on MATH10222/11222 Exam Section A

Q1 (a) Not that convincingly answered on the whole – poor understanding of how to apply existence & uniqueness theorem for linear ODEs.

(b) Most students were able to obtain equations for the isoclines, but plots varied in quality, or sometimes featured only the integral curves with no direction field or isoclines.

(c) Almost all students were able to integrate correctly, apart from the odd algebraic error.

Q2 Mostly well done – a few students couldn't remember the method for solving equations such as this and ran aground. Otherwise, mostly little algebraic errors and missing minus signs.

Q3 Almost all students were able to identify the correct homogeneous solution, and most were able to find a suitable ansatz for the particular solution with varying degrees of trial and error (pleasingly, most spotted the degenerate case before wasting pages of algebra). There were quite a few calculation errors, particularly in applying the boundary conditions at the end of the problem, which caused a surprising number of difficulties. A few students ignored the "normal" approach altogether and tried to use integration by parts to get the answer...

Q4 A surprising number of students skipped this question altogether, or didn't complete it. Most students were able to extract the differential equations for x_0 and x_1, but many did not correctly expand the initial conditions, leading to errors in the final answer. Most were able to successfully solve the two equations, but again there were issues with algebra in deriving the correct coefficients.

Q5 This question was mostly well done, with a lot of students recognising the correct method of a attack. A few struggled in applying the second of the two ICs to eliminate the final constant in their solution.