

Math115 Test 4

March 18th, 2009

Answer all parts of the question and give complete reasons and checks for your answers. The parts of the questions are weighted as shown in square brackets on the right. You are reminded that plagiarism is a serious offense and anyone caught copying or being copied will receive a mark of zero and will be reported to the Dean.

1. (a) Find the values of a_3 and a_4 given this recurrence: [2]

$$a_{n+1} := 19a_{n-1} + 30a_{n-2}, \quad a_0 := 0, a_1 := 0, a_2 := 56$$

- (b) Use the special diagonalisation recurrence shortcuts and the adjoint method to find the general formula for a_k and check for a_0 through to a_4 . [7]
- (c) What pattern would there be for a recurrence of the form $c_{n+1} := kc_{n-2}$? [1]

2. (a) Find the exact fit quadratic for this data. [4]

x	2	3	4
y	3	2	3

- (b) What is the equation of the best fit straight line to the data? [5]
- (c) Which data point is furthest away vertically from the best fit line? [1]