Question 8 **(9 marks)**

A farmer has a large lake on his farm and has started stocking it with fish of a variety that will flourish in the conditions in this lake. Monitoring has shown that the number of adult fish is increasing at a consistent rate of 9% per month and at the beginning of 2020 the lake holds 660 of the adult fish.

(a) Write a recursive rule to give the number of adult fish in the lake at the end of each month from the beginning of 2020. (2 marks)

(b) Deduce a rule for the n^{th} term of this sequence. (2 marks)

The farmer plans to allow the general public to pay to fish in the lake. This will commence at the beginning of the next month after the adult fish population first reaches 4000.

(c) Determine how many months after the beginning of 2020 fishing will commence. (2 marks)

(d) The farmer wishes to maintain a steady state in the adult fish population once fishing commences. Calculate how many adult fish can be taken from the lake each month.

(3 marks)