Question 7 **(9 marks)**

Julie buys a car with a purchase price of $13 000. However, she has been told to expect the car to depreciate in value. The value of the car after n years can be determined by using the recursive rule.

$$T_{n+1} = 0.85T_n, \ T_0 = 13\,000$$

(a) Complete the table below to show the value of the car at the end of each year, to the nearest dollar. (2 marks)

n	0	1	2	3
Value of car after n years ($)	13 000			

(b) Use the information above to determine the rate of depreciation of Julie's car per year. (1 mark)

(c) Determine a rule for the n^{th} term of the sequence of values found in part (a). (2 marks)

(d) Determine the value of Julie's car after eight years, correct to the nearest dollar. (2 marks)

(e) Julie decides that she will sell her car at the end of the year in which its value drops to half of the purchase price. After how many years should she sell her car? (2 marks)