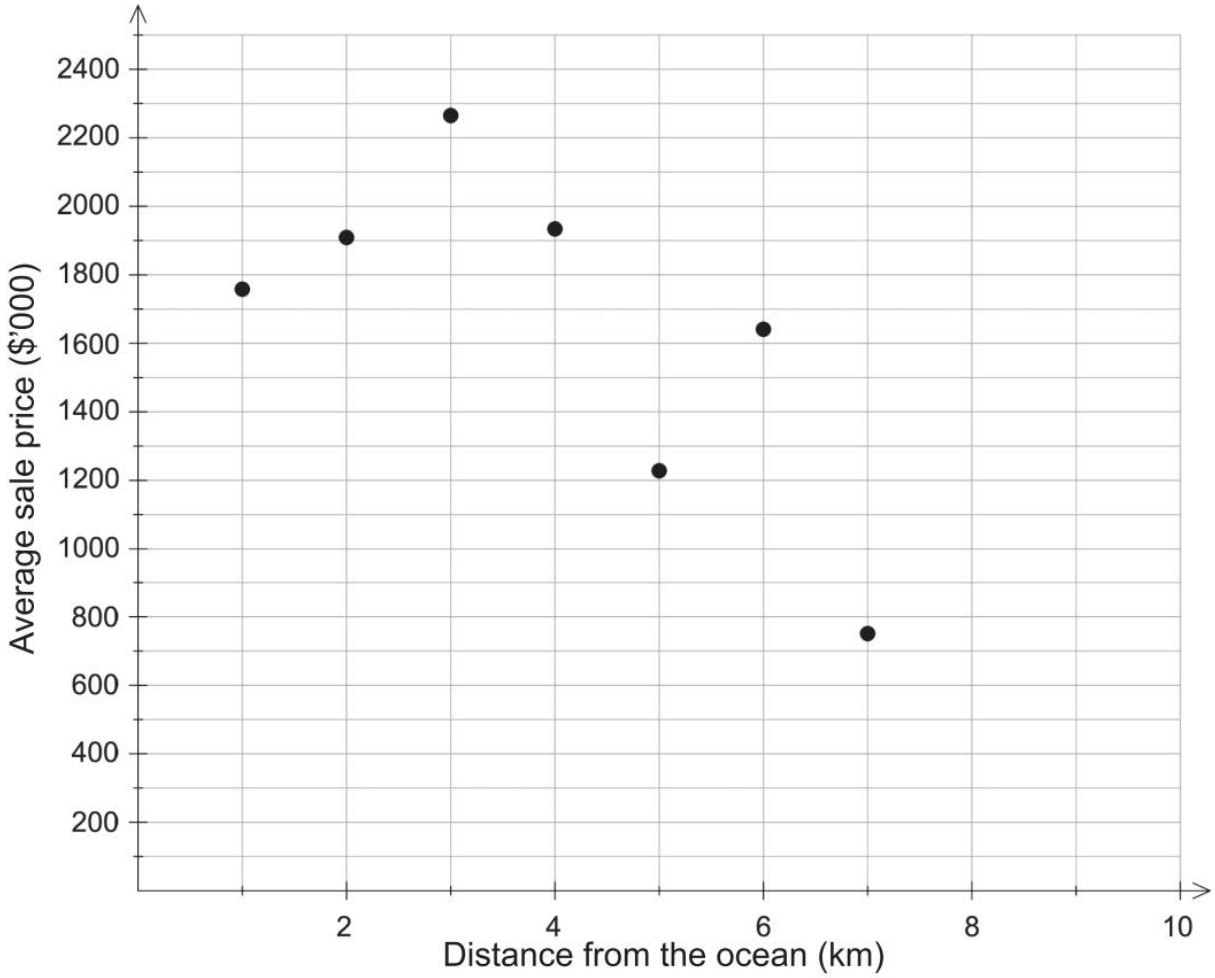
Question 9 **(15 marks)**

A real estate agent is analysing data on the sale of houses over the last six months. The table shows the average sale price of houses, in thousands of dollars ($'000), and their distance from the ocean, to the nearest kilometre.

Distance from the ocean (km)	1	2	3	4	5	6	7	8	9
Average sale price ($'000)	1758	1909	2265	1934	1228	1641	751	967	676

(a) State the explanatory variable. (1 mark)

(b) On the scatterplot below, plot the last two data points from the table. (1 mark)



(c) Determine the equation of the least-squares line for these data. (1 mark)

(d) Interpret the slope of the least-squares line from part (c) in the context of this question. (2 marks)

(e) (i) State the value of the correlation coefficient for these data. (1 mark)

(ii) What does the correlation coefficient measure? (1 mark)

(iii) Describe the association between the variables in terms of direction and strength. (2 marks)

(f) What percentage of the variation in average sale price can be explained by the variation in the distance from the ocean? (1 mark)

(g) In six months time, a homebuyer will have saved enough money for a deposit on a house. He would like to live about four kilometres from the ocean.

(i) Use the equation of the least-squares line from part (c) to predict the average sale price of houses four kilometres from the ocean. (1 mark)

(ii) Explain why your prediction is different from the average sale price given in the table. (1 mark)

(h) Give a reason why extrapolation in the context of this question would not make sense. (1 mark)

(i) The real estate agent was talking to some potential buyers and was heard to make the statement, “Having property closer to the ocean causes higher selling prices”. Comment on this statement. (2 marks)