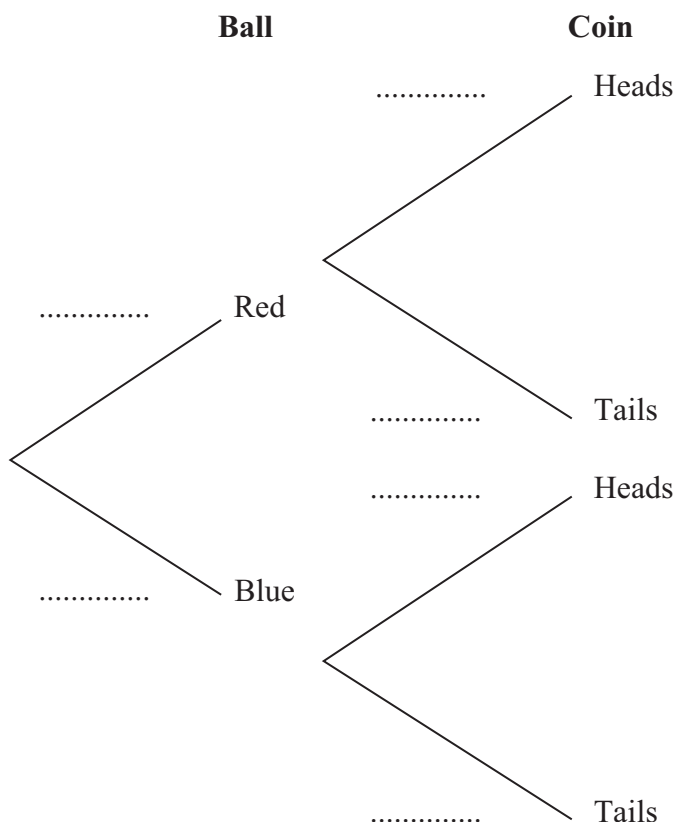


2. An experiment consists of selecting a ball from a bag and spinning a coin. The bag contains 5 red balls and 7 blue balls. A ball is selected at random from the bag, its colour is noted and then the ball is returned to the bag.

When a red ball is selected, a biased coin with probability $\frac{2}{3}$ of landing heads is spun.

When a blue ball is selected a fair coin is spun.

- (a) Complete the tree diagram below to show the possible outcomes and associated probabilities.



(2)

Shivani selects a ball and spins the appropriate coin.

- (b) Find the probability that she obtains a head.

(2)

Given that Tom selected a ball at random and obtained a head when he spun the appropriate coin,

- (c) find the probability that Tom selected a red ball.

(3)

Shivani and Tom each repeat this experiment.

- (d) Find the probability that the colour of the ball Shivani selects is the same as the colour of the ball Tom selects.

(3)



6. A travel agent sells flights to different destinations from *Beerow* airport. The distance d , measured in 100 km, of the destination from the airport and the fare $\pounds f$ are recorded for a random sample of 6 destinations.

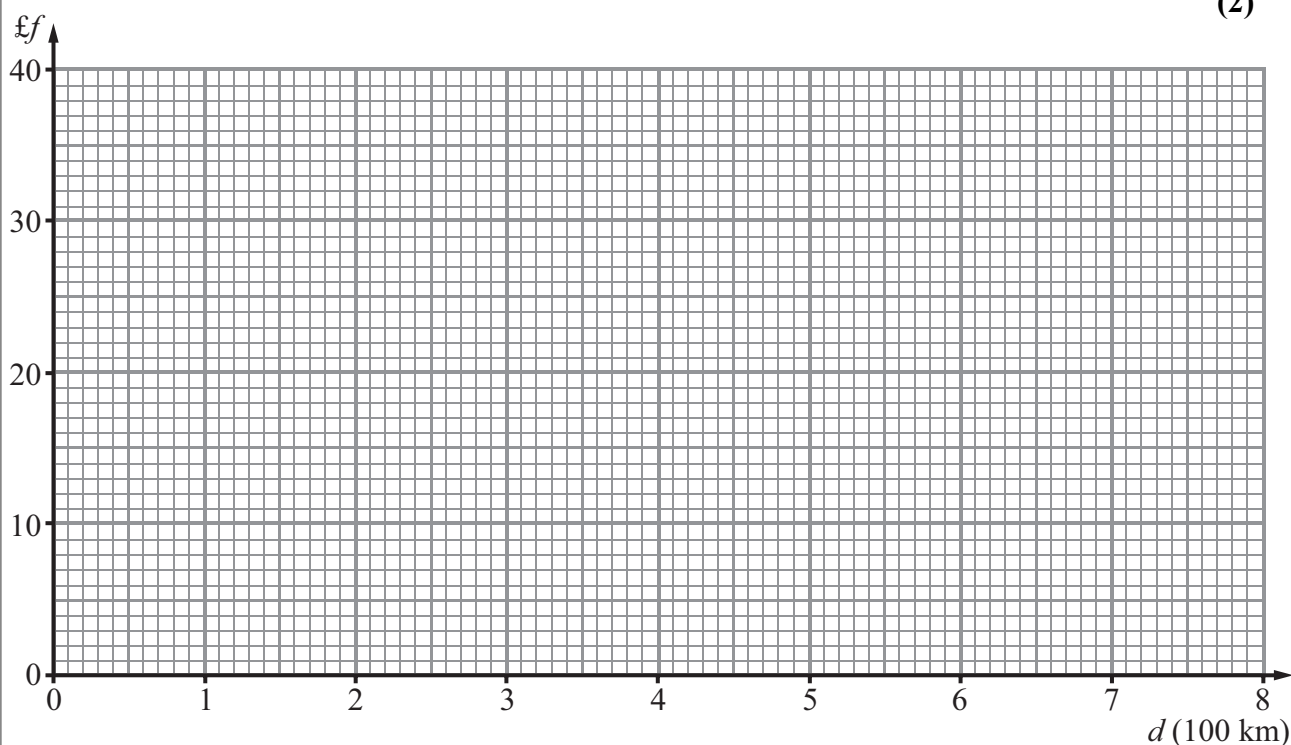
Destination	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
d	2.2	4.0	6.0	2.5	8.0	5.0
f	18	20	25	23	32	28

[You may use $\sum d^2 = 152.09$ $\sum f^2 = 3686$ $\sum fd = 723.1$]

- (a) Using the axes below, complete a scatter diagram to illustrate this information. (2)
- (b) Explain why a linear regression model may be appropriate to describe the relationship between f and d . (1)
- (c) Calculate S_{dd} and S_{fd} (4)
- (d) Calculate the equation of the regression line of f on d giving your answer in the form $f = a + bd$. (4)
- (e) Give an interpretation of the value of b . (1)

Jane is planning her holiday and wishes to fly from *Beerow* airport to a destination t km away. A rival travel agent charges 5p per km.

- (f) Find the range of values of t for which the first travel agent is cheaper than the rival. (2)



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