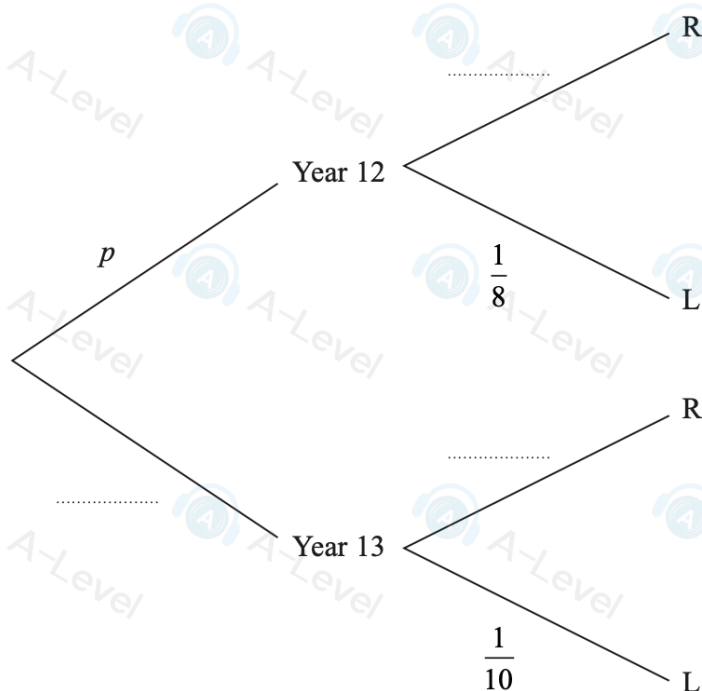


3. In a sixth form college each student in Year 12 and Year 13 is either left-handed (L) or right-handed (R).

The partially completed tree diagram, where p is a probability, gives information about these students.



- (a) Complete the tree diagram, in terms of p where necessary.

(1)

The probability that a student is left-handed is 0.11

- (b) Find the value of p

(3)

- (c) Find the probability that a student selected at random is in Year 12 and left-handed.

(2)

Given that a student is right-handed,

- (d) find the probability that the student is in Year 12

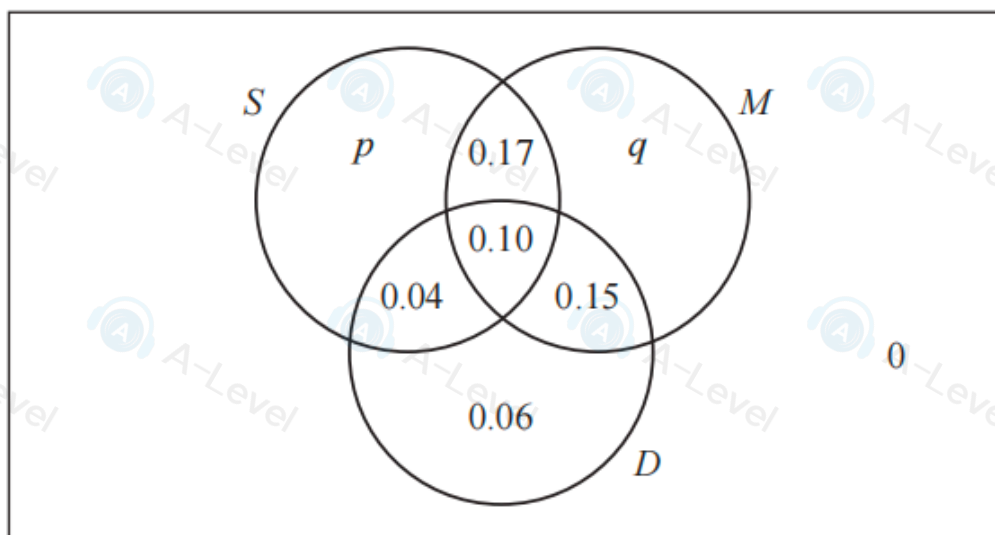
(2)

6. The Venn diagram below shows the probabilities of customers having various combinations of a starter, main course or dessert at Polly's restaurant.

S = the event a customer has a starter.

M = the event a customer has a main course.

D = the event a customer has a dessert.



Given that the events S and D are statistically independent

- (a) find the value of p .

(4)

- (b) Hence find the value of q .

(2)

- (c) Find

(i) $P(D | M \cap S)$

(ii) $P(D | M \cap S')$

(4)

One evening 63 customers are booked into Polly's restaurant for an office party. Polly has asked for their starter and main course orders before they arrive.

Of these 63 customers

27 ordered a main course and a starter,

36 ordered a main course without a starter.

- (d) Estimate the number of desserts that these 63 customers will have.

(2)

5. A housing estate consists of 320 houses.

A house on the estate is selected at random.

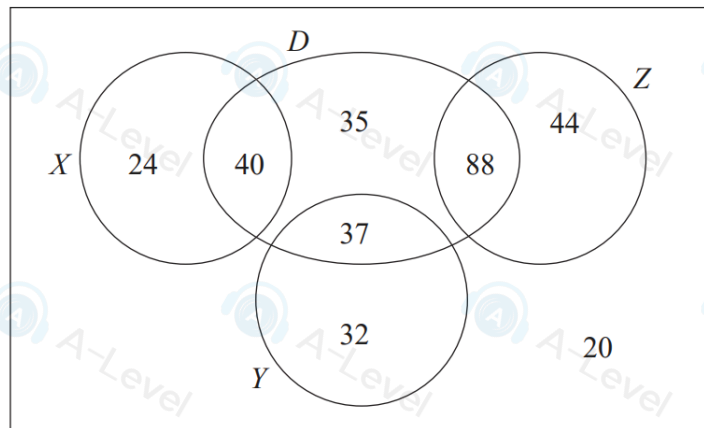
D denotes the event 'the house has a driveway'

X denotes the event 'no cars per household'

Y denotes the event 'exactly 1 car per household'

Z denotes the event 'exactly 2 cars per household'

The Venn diagram shows the number of households in each region for the events D , X , Y and Z .



- (a) Find (i) $P(D)$

(1)

- (ii) $P(D \cap X')$

(1)

- (iii) $P(D' \cup Z')$

(2)

Given that the house has a driveway,

- (b) find the probability that there are exactly 2 cars in the household.

(2)

- (c) Write down 2 of the events D , X , Y and Z that are mutually exclusive.

(1)

- (d) Determine whether the events D and X are independent. Justify your answer.

(2)

- (e) Define in the context of this question, the event

- (i) $D' \cap Z$

(1)

- (ii) $D \cap (X \cup Y)$

(2)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

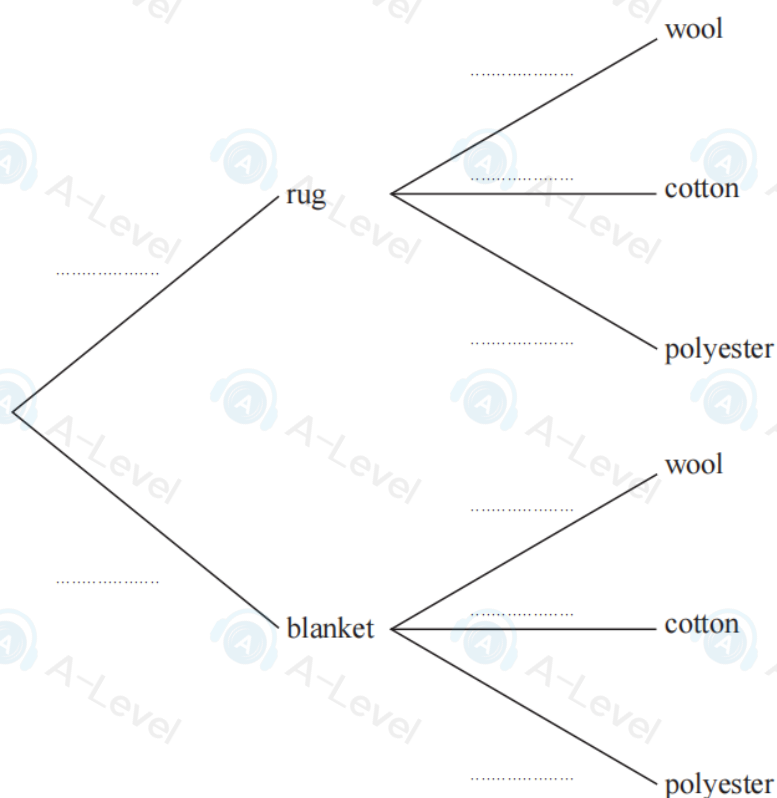
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3. A factory makes rugs and blankets from wool **or** cotton **or** polyester.

- 30% of the items made are rugs and 70% of the items made are blankets
- 60% of the rugs are made from wool
- 35% of the blankets are made from wool
- 10% of the rugs are made from cotton
- 20% of the blankets are made from cotton
- the rest of the rugs and blankets are made from polyester

An item made by the factory is selected at random.

(a) Complete the tree diagram below to illustrate this information.



(2)

(b) (i) Find the probability that the item selected is **not** made from wool.

(2)

(ii) Given that this item is **not** made from wool, find the probability that it is a blanket.

(2)