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5. A housing estate consists of 320 houses.

A house on the estate is selected at random.

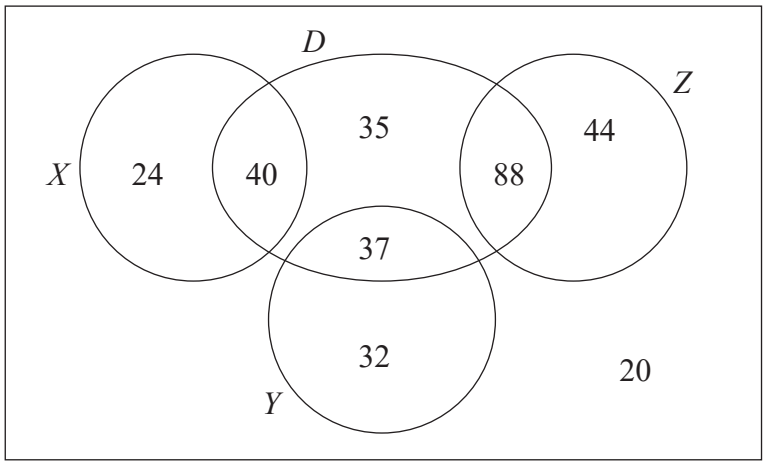
D denotes the event 'the house has a driveway'

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)

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Question 5 continued

(Total 12 marks)

Q5