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2. A group of 40 families was asked whether their family had a dog, a cat or a rabbit as pets.

No family had a dog and a rabbit
2 families had both a dog and a cat
12 families had a dog
14 families had a cat
11 families had a rabbit
9 families did not have any of these animals as pets

A family from this group is selected at random.

D represents the event that the family has a dog
C represents the event that the family has a cat
R represents the event that the family has a rabbit

(a) Draw a Venn diagram to illustrate this information.

(4)

(b) State, giving a reason, a pair of mutually exclusive events from D, C and R.

(1)

(c) Find the probability that the family has exactly 2 of these kinds of animals as pets.

(1)

(d) Showing your working clearly, determine whether or not the events D and C are independent.

(2)

Sarah's family is in the group and her family has a pet cat.

(e) Find the probability that Sarah's family also has a pet rabbit.

(2)

(f) Find the exact value of $P([D \cup R] \mid C')$

(2)

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Question 2 continued

(Total 12 marks)

Q2