

4.2 Classwork: Venn Diagrams and probability

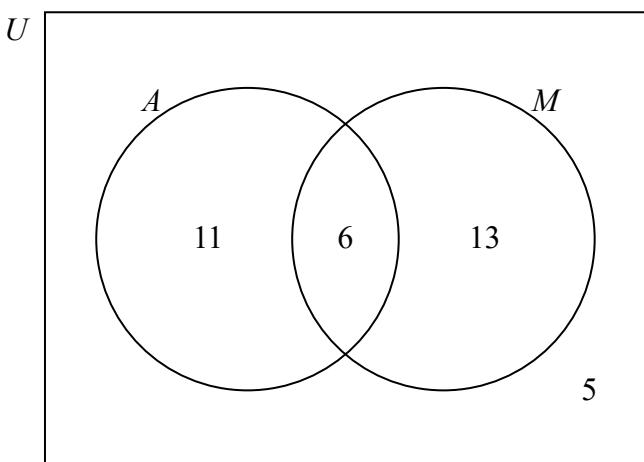
Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. In particular, solutions found from a graphic display calculator should be supported by suitable working, for example if graphs are used to find a solution, you should sketch these as part of your answer. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written working. You are therefore advised to show all working.

Section A

Answer **all** questions. Answers must be written within the answer boxes provided. Working may be continued below the lines if necessary.

1. [Maximum mark: 6]

In a group of 35 students, some take art class (A) and some take music class (M). 5 of these students do not take either class. This information is shown in the following Venn diagram.



- (a) Write down the number of students in the group who take art class. [2]
- (b) One student from the group is chosen at random. Find the probability that
- (i) the student does not take art class;
 - (ii) the student takes either art class or music class, but not both. [4]

(This question continues on the following page)



(Question 1 continued)



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Turn over

2. [Maximum mark: 14]

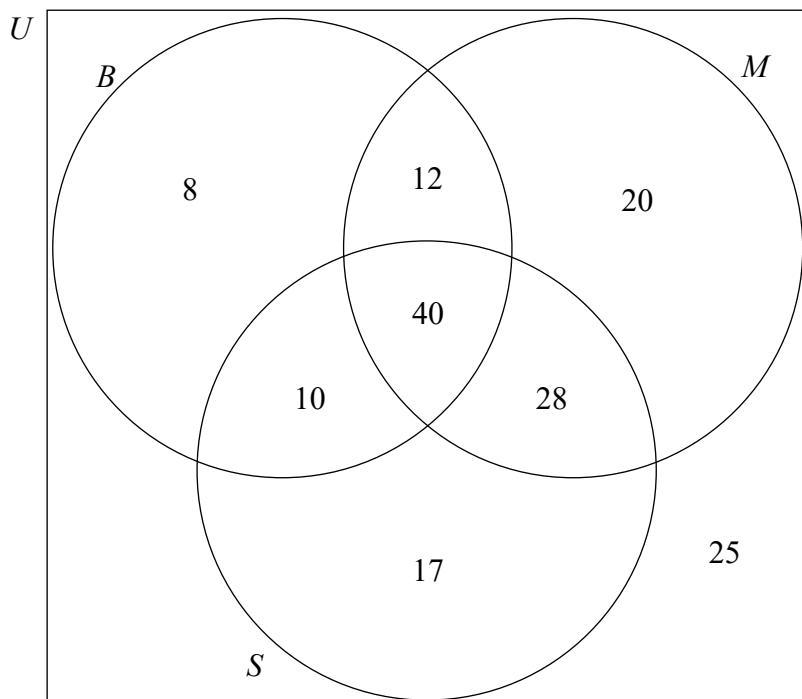
160 students attend a dual language school in which the students are taught only in Spanish or taught only in English.

A survey was conducted in order to analyse the number of students studying Biology or Mathematics. The results are shown in the Venn diagram.

Set S represents those students who are **taught** in Spanish.

Set B represents those students who **study** Biology.

Set M represents those students who **study** Mathematics.



(a) Find the number of students in the school that

- (i) are taught in Spanish;
- (ii) study Mathematics in English;
- (iii) study both Biology and Mathematics.

[6]

(This question continues on the following page)

(Question 2 continued)

(b) Write down

(i) $n(S \cap (M \cup B))$;

(ii) $n(B \cap M \cap S')$.

[2]

A student from the school is chosen at random.

(c) Find the probability that this student

(i) studies Mathematics;

(ii) studies neither Biology nor Mathematics;

(iii) is taught in Spanish, given that the student studies Biology.

[6]