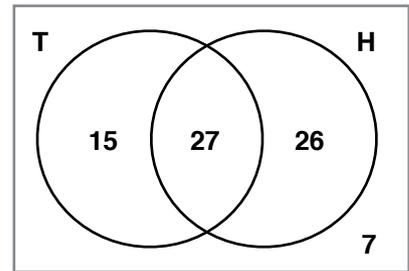


Solving Problems using Venn Diagrams

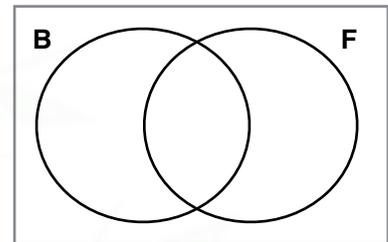
Starter

1. The Venn diagram alongside shows the number of people in a sporting club who play tennis (T) and hockey (H). Find the number of people:
- in the club
 - who play hockey
 - who play both sports
 - who play neither sport
 - who play at least one sport
 - who play tennis but not hockey



2. Consider the Venn diagram from question 1. If a person is chosen at random what is the **probability** they:
- play tennis and hockey
 - do not play tennis or hockey
 - play hockey but not tennis
 - do not play hockey

3. In a group of **20 boys**:
- 6 have blue eyes.
 - 13 have fair hair.
 - 4 have fair hair and blue eyes.
 - 5 have neither blue eyes nor fair hair.
- Copy and complete the Venn Diagram with this information.
 - How many boys have blue eyes but not fair hair?



Notes

Often questions require you to draw a Venn diagram from the information given and calculate one of the value that is missing.

E.g. 1 In a group of 24 girls, 18 like oranges, 7 like bananas and 4 like neither oranges nor bananas.

- Draw a Venn diagram to illustrate this information.
- How many girls like both fruit?

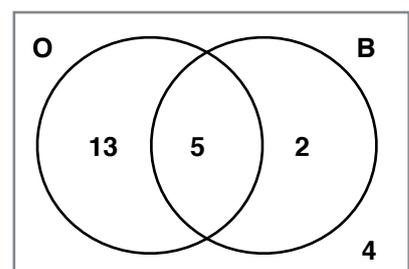
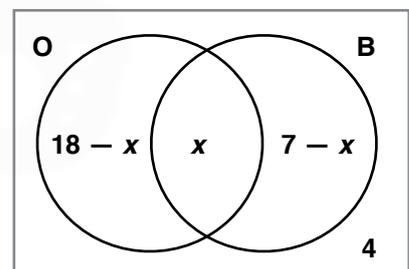
Working: (a) 4 goes outside the circles

Let the overlap be x
 18 like oranges so $18 - x$ goes in O but outside B
 N.B. $18 - x + x = 18$

7 like oranges so $7 - x$ goes in B but outside O.

There are 24 girls so:
 $18 - x + x + 7 - x + 4 = 24$
 $x = 5$

- 5 girls like both fruit (intersection)



N.B. When completing the Venn diagram, fill in the number in the overlap or outside the circles first.

E.g. 2 24 out of class of 32 students study History or Geography, or both.
15 study History but not Geography. 5 study Geography but not History.

- (a) Draw a Venn diagram to illustrate this information.
- (b) A student is chosen at random. Find the probability that the student:
 - (i) studies both History and Geography
 - (ii) does not study History

E.g. 3 In a class of 30 students, 19 study Physics, 17 study Chemistry, and 15 study both of these subjects.

- (a) Display this information on a Venn diagram.
- (b) Find the probability that a student chosen at random studies
 - (i) both subjects
 - (ii) at least one of the subjects
 - (ii) Physics but not Chemistry
 - (iv) exactly one of the subjects.

Video: [Venn diagrams](#)

[Solutions to Starter and E.g.s](#)

Exercise

Worksheet **Solving problems using Venn diagrams** Qu 1-3

9-1 class textbook: p246 M8.7 Qu 1-6 (Look at Qu 2 and 5 in class)

A*-G class textbook: No exercise

9-1 homework book: p84 M8.7 Qu 1-5

A*-G homework book: No exercise

Summary

When completing the Venn diagram, fill in the number in the overlap or outside the circles first.

Solving problems using Venn diagrams SOLUTIONS
[Homework book answers \(only available during a lockdown\)](#)