Guide to: Venn diagrams

maths Links

Explanation:

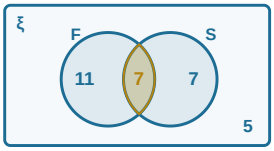
When completing a Venn diagram, always fill in the **central overlap (intersection A ∩ B)** first. Subtract the overlap from the total for circle A to find the **"A only"** region, do the same for **"B only"**, and check that all regions (including outside the circles) add up to the universal set **ξ**.

Set notation: **A ∩ B** means in **both** A and B; **A ∪ B** means in A **or** B (or both); **A′** means **not** in A.

Example 1: In a class of **30** students (ξ), **18** study French (F), **14** study Spanish (S), and **5** study neither. How many study **both**?

Solution:

In F ∪ S = 30 − 5 = **25**
18 + 14 = **32**
Both = 32 − 25 = **7**
Answer: 7 students



Example 2: Using Example 1, a student is chosen at random. Find (a) **P(F ∪ S)** and (b) **P(F given S)**.

Solution:

(a) 25 out of 30 are in F ∪ S → $\frac{25}{30} = \frac{\mathbf{5}}{\mathbf{6}}$
(b) Given the student studies Spanish (**14** students),
7 of those also study French → $\frac{7}{14} = \frac{\mathbf{1}}{\mathbf{2}}$
Answer: (a) $\frac{5}{6}$, (b) $\frac{1}{2}$

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