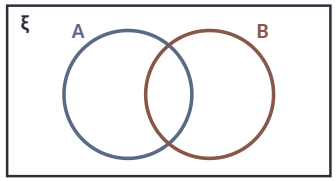
# Venn diagrams: fact sheet

Planner week 16 · Learn these facts

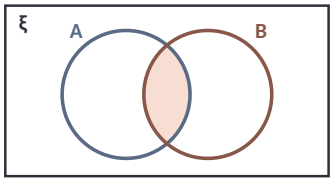
## ξ the universal set




Everything in the question

**Outside the circles too**

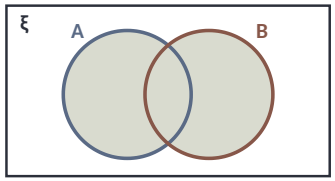
## A ∩ B (and)




In A **and** in B

**The middle**

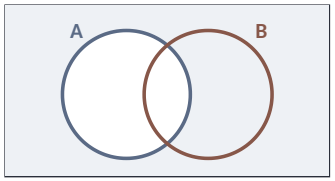
## A ∪ B (or)




In A **or** B or both

**Everything in the circles**

## A′ (not)




Not in A

**Everything outside A**

## Filling in

**1. the middle first**

**2. the rest of A and B**

**3. outside**

Use each number once

## Probability

**count in the region**

**÷ count in ξ**

e.g. $\frac{2}{10}$

## Counting multiples

multiples of 3 and 5

**= multiples of 15**

**15, 30 … 90: 6**

Both means the LCM

## Symbols

| | |
|---|---|
| ξ | everything |
| ∩ | and (both) |
| ∪ | or (either) |
| ′ | not |

## Key words

- **Set** a group of numbers or things
- **ξ** the universal set: everything
- **Intersection ∩** in both sets
- **Union ∪** in either set or both

## Exam tips

- List each set first.
- Fill in the overlap first.
- Every number in ξ goes somewhere, even outside the circles.
- Each number appears only once.
- Probability: count, then divide by everything in ξ.
- Cross numbers off as you place them.

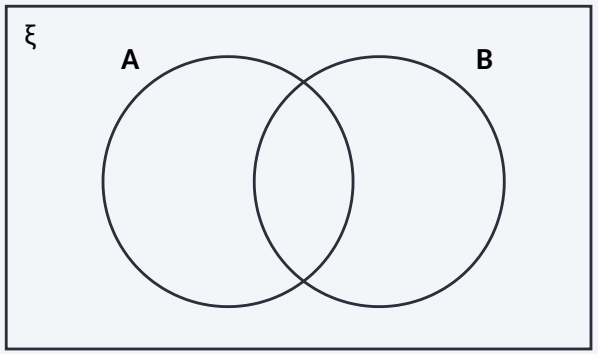
# Venn diagrams: fact sheet

Venn diagrams · Planner week 16 · Learn the method

## Worked example

QUESTION

ξ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}. A = even numbers. B = factors of 10.
(a) Complete the Venn diagram. (b) A number is picked at random.
Find P(A ∩ B).




ANSWER

1. Both (A ∩ B), in the middle: 2, 10
2. A only: 4, 6, 8  B only: 1, 5
3. Outside both circles: 3, 7, 9
4. (b) 2 numbers in the middle, out of 10

**(b) $\frac{2}{10} = \frac{1}{5}$**

Middle first, then the rest of each circle, then outside.

## How to do it

1. Write out each set.
2. Find the numbers in both: put them in the overlap.
3. Put the rest of A and the rest of B in.
4. Anything left in ξ goes outside.
5. Probability: count the region ÷ count of ξ.

Model answer:

(b) $\frac{2}{10} = \frac{1}{5}$

## Watch out

- Writing a number twice.
- Forgetting the numbers outside the circles.
- Mixing up ∩ and ∪.