Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

- $A \cap B$ is the elements in **both**
- $\boldsymbol{\{2, 4\}}$

2.2

- $A \cup B$ is the elements in A or B or both
- $\boldsymbol{\{1, 2, 3, 4, 6, 8\}}$

2.3

- $A' = \{5, 6, 7, 8\}$
- $n(A') = \mathbf{4}$

2.4

- primes up to 10: $C = \boldsymbol{\{2, 3, 5, 7\}}$
- $n(C) = \mathbf{4}$

2.5

(a) **true**: 6 is an element of D

(b) **false**: 5 is not in D

3.1

(a)

- $P = \{3, 6, 9, 12\}$, $Q = \{1, 2, 3, 4, 6, 12\}$
- $P \cap Q = \boldsymbol{\{3, 6, 12\}}$

(b)

- $P \cup Q = \{1, 2, 3, 4, 6, 9, 12\}$
- $n(P \cup Q) = \mathbf{7}$

3.2

- $A \cap B'$ is the part of circle A **outside** the overlap
- the elements that are in A but **not** in B

3.3

(a)

- in at least one language: $40 - 3 = 37$, so $22 + 25 - x = 37$
- $47 - x = 37$, so $\boldsymbol{x = 10}$

(b)

- French but not Spanish: $22 - 10 = \mathbf{12}$

3.4

- $A \cup B = \{2, 3, 4, 6, 8, 9, 10, 12\}$
- $(A \cup B)' = \boldsymbol{\{1, 5, 7, 11\}}$

3.5

(a)

- $A = \{2, 4, 6, 8, 10, 12\}$, $B = \{3, 6, 9, 12\}$, $C = \{1, 2, 3, 4, 6, 12\}$
- in all three: $\boldsymbol{\{6, 12\}}$

(b)

- $C' = \{5, 7, 8, 9, 10, 11\}$, so $A \cap C' = \{8, 10\}$
- $n(A \cap C') = \mathbf{2}$