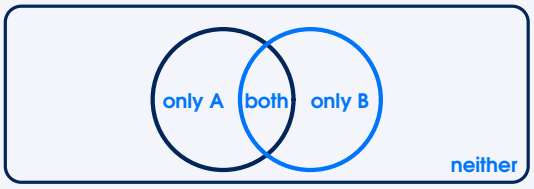
VENN DIAGRAMS

BUILDING BLOCKS

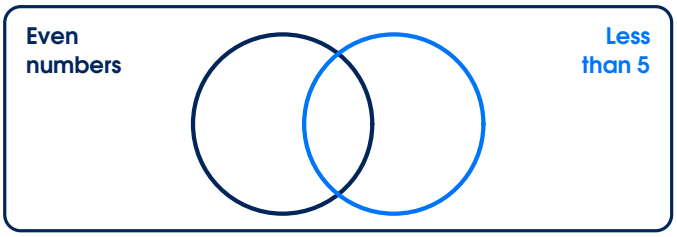
NAME _____ CLASS _____ DATE _____

KEY IDEA

A Venn diagram sorts things into groups. The overlap is for things in both groups. Things in neither group go outside the circles.



1 Sort the numbers 1 to 10 into the Venn diagram.

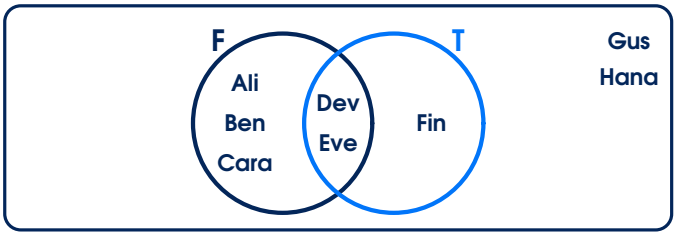


Numbers to sort:

1 2 3 4 5
6 7 8 9 10

Cross off each number as you place it.

2 The Venn diagram shows who plays football (F) and who plays tennis (T).

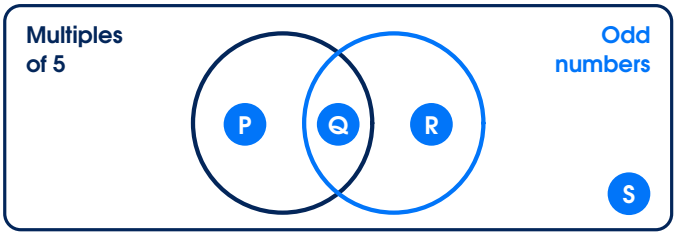


a) Who plays both? _____

b) How many play tennis? _____

c) Who plays neither? _____

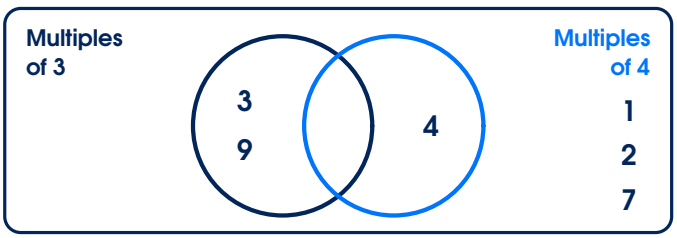
3 Which region, P, Q, R or S, does each number go in?



15 → _____ 20 → _____

7 → _____ 4 → _____

4 Complete the Venn diagram.



Write these numbers in the correct place:

6 8 12 5

VENN DIAGRAMS

SUPPORT

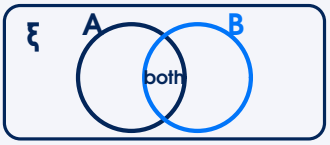
NAME _____ CLASS _____ DATE _____

KEY IDEA

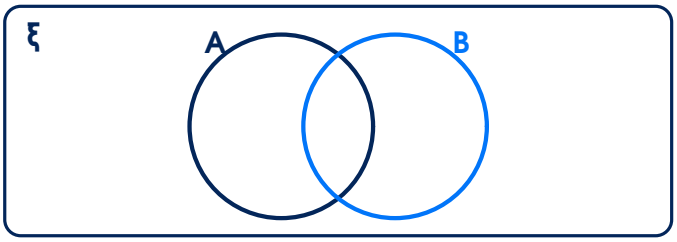
ξ is the universal set: everything you are sorting.

The overlap is the intersection: elements in both sets.

Write every element once only.



1 Complete the Venn diagram.

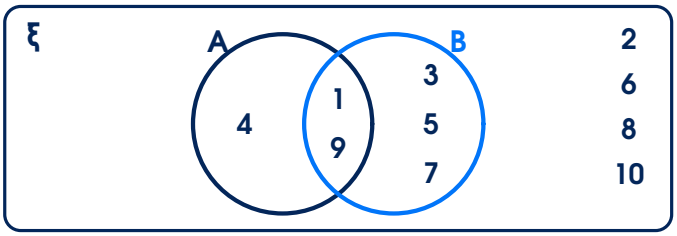


ξ = {1, 2, 3, ..., 12}

A = {multiples of 2}

B = {multiples of 3}

2 Use the Venn diagram.



a) List the elements of A. ____

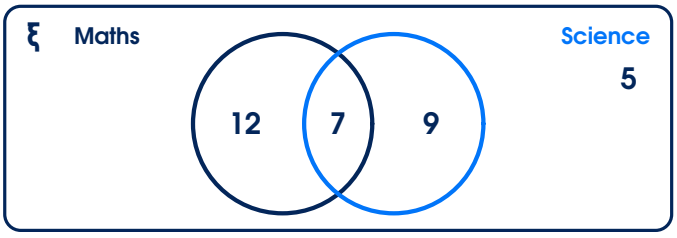
b) List the elements in both. ____

c) How many are not in B? ____

d) What could A and B be?

.....

3 People were asked if they like maths and if they like science.

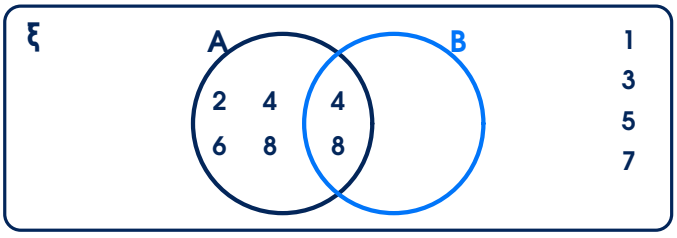


a) How many like maths? ____

b) How many were asked? ____

c) How many like only one? ____

4 Kim has drawn this Venn diagram.



ξ = {1, 2, 3, ..., 8}

A = {even numbers}

B = {multiples of 4}

What has Kim done wrong?

.....

VENN DIAGRAMS

CORE

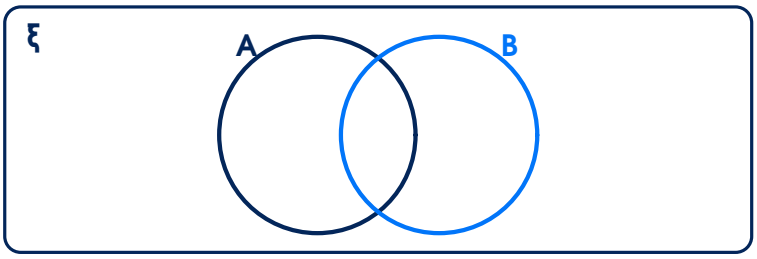
NAME _____ CLASS _____ DATE _____

KEY IDEA

Every element of ξ goes in exactly one region. The elements of A include the ones in the intersection. Elements in neither set go inside the rectangle but outside the circles.

FLUENCY

1 Complete the Venn diagram.

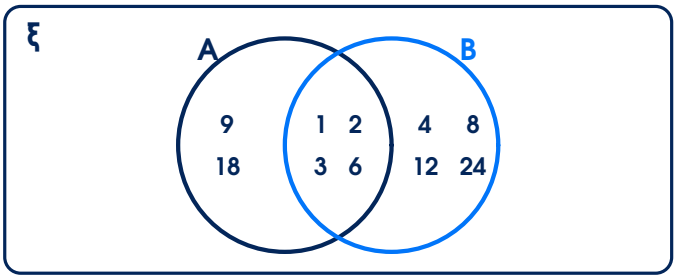


ξ = {1, 2, 3, ..., 20}

A = {prime numbers}

B = {odd numbers}

2 Use the Venn diagram.



A = {factors of 18}

B = {factors of 24}

a) What does the intersection show?

.....

b) The HCF of 18 and 24 is ☐

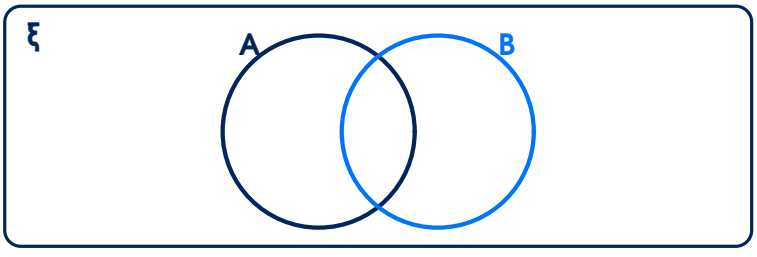
REASONING

3 A = {odd numbers} and B = {even numbers}. Explain why the intersection is empty. How else could you draw this Venn diagram?

.....

.....

4 Complete the Venn diagram. Write each letter once.



ξ = {letters in MATHEMATICS}

A = {letters in MATHS}

B = {vowels}

VENN DIAGRAMS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) Prime numbers and square numbers share no elements. ALWAYS SOMETIMES NEVER

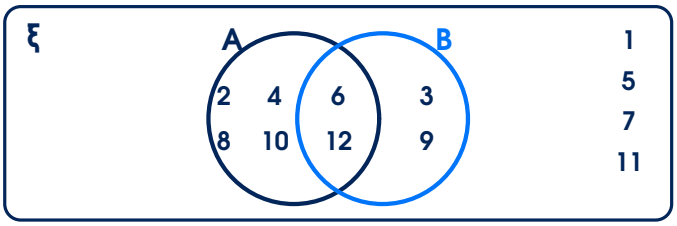
b) An element of A is in the intersection of A and B. ALWAYS SOMETIMES NEVER

c) Every element of ξ is in exactly one region. ALWAYS SOMETIMES NEVER

d) Multiples of 3 and multiples of 5 never overlap. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 Here is a completed Venn diagram. Describe sets A and B.

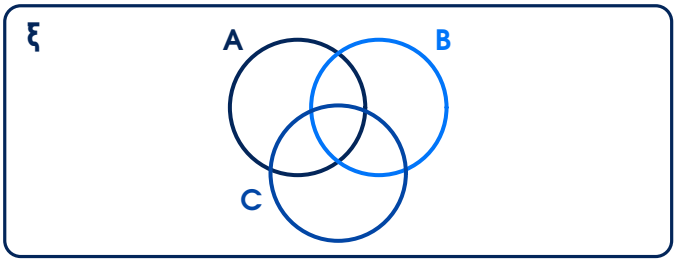


ξ = {1, 2, 3, ..., 12}

A = _____

B = _____

3 Write each number in the correct region.



ξ = {1, 2, 3, ..., 20}

A = {prime numbers}

B = {odd numbers}

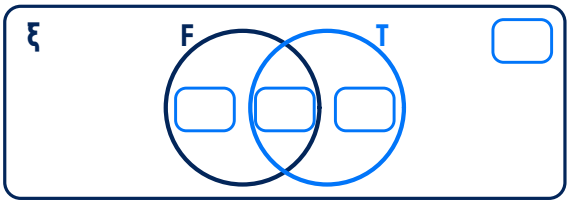
C = {multiples of 3}

Place these numbers:

1 2 3 6 9 11 12

★ CHALLENGE FOR ALL

4 30 students: 18 play football, 15 play tennis and 4 play neither.



a) How many play both sports? ☐

b) Complete the Venn diagram.

c) What fraction play only tennis? ☐

VENN DIAGRAMS

ANSWERS

BUILDING BLOCKS

1. Even only: 6, 8, 10 · both: 2, 4 · less than 5 only: 1, 3 · outside: 5, 7, 9
2. a) Dev and Eve · b) 3 · c) Gus and Hana
3. 15 → Q · 20 → P · 7 → R · 4 → S
4. 6 → multiples of 3 only · 8 → multiples of 4 only · 12 → overlap · 5 → outside

SUPPORT

1. A only: 2, 4, 8, 10 · both: 6, 12 · B only: 3, 9 · outside: 1, 5, 7, 11
2. a) 1, 4, 9 · b) 1, 9 · c) 5 (2, 4, 6, 8, 10) · d) e.g. A = square numbers, B = odd numbers
3. a) 19 · b) 33 · c) 21
4. 4 and 8 are written twice. They belong only in the overlap, so A only should be 2, 6.

CORE

1. A only: 2 · both: 3, 5, 7, 11, 13, 17, 19 · B only: 1, 9, 15 · outside: 4, 6, 8, 10, 12, 14, 16, 18, 20
2. a) the common factors of 18 and 24 · b) 6
3. No number is both odd and even. The circles can be drawn apart (not overlapping).
4. A only: M, T, H, S · both: A · B only: E, I · outside: C

GREATER DEPTH

1. a) always (1 is not prime; other squares have 3 or more factors) · b) sometimes · c) always · d) never: 15, 30, ... are in both
2. e.g. A = {even numbers}, B = {multiples of 3}
3. 1: B only · 2: A only · 3: A, B and C · 6: C only · 9: B and C · 11: A and B · 12: C only
4. a) 7 · b) F only 11, both 7, T only 8, neither 4 · c) $\frac{8}{30} = \frac{4}{15}$