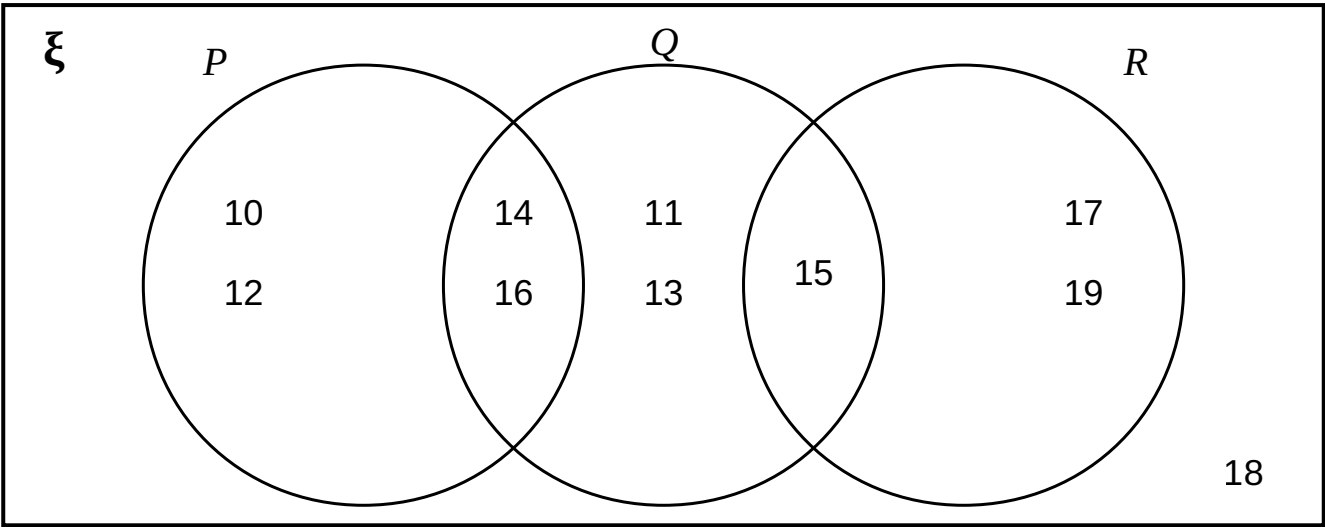


PROBABILITY & STATISTICS: VENN DIAGRAMS

Best Guess Mastery Worksheet (Target Grade 5/6)

I Do

Here is a Venn diagram.



- (a) Write down the numbers that are in the set
- (i) Q

.....

- (ii) $P \cup R$

.....

Alice writes down the statement $P \cap R = \emptyset$

- (b) Is Alice's statement correct?

You must give a reason for your answer.

.....

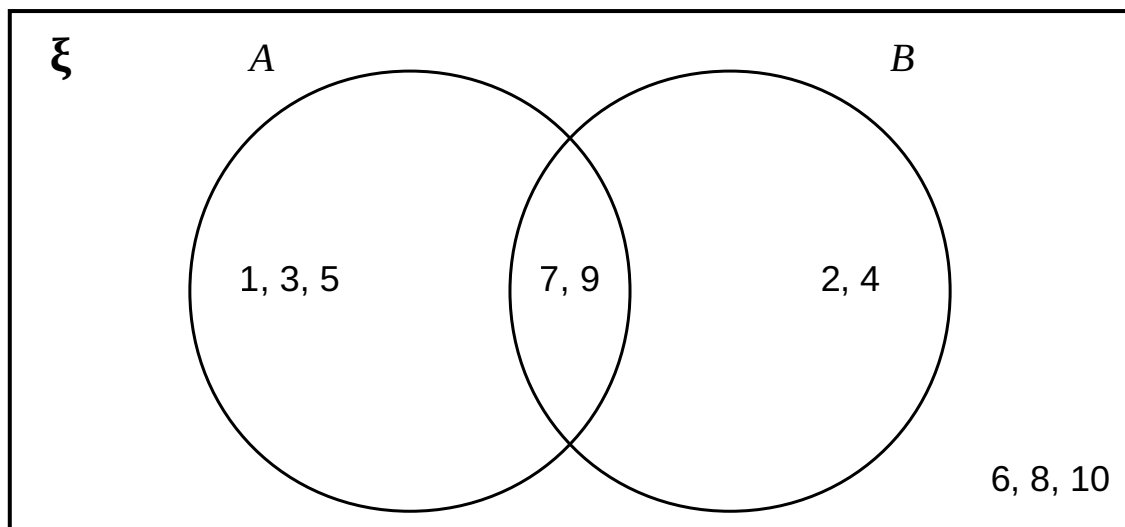
One of the numbers in the Venn diagram is picked at random.

- (c) Find the probability that this number is in set Q' .

.....

PROBABILITY & STATISTICS: VENN DIAGRAMS**Best Guess Mastery Worksheet (Target Grade 5/6)****We Do**

Here is a Venn diagram showing sets A and B .



(a) Write down the numbers that are in the set

(i) $A \cap B$

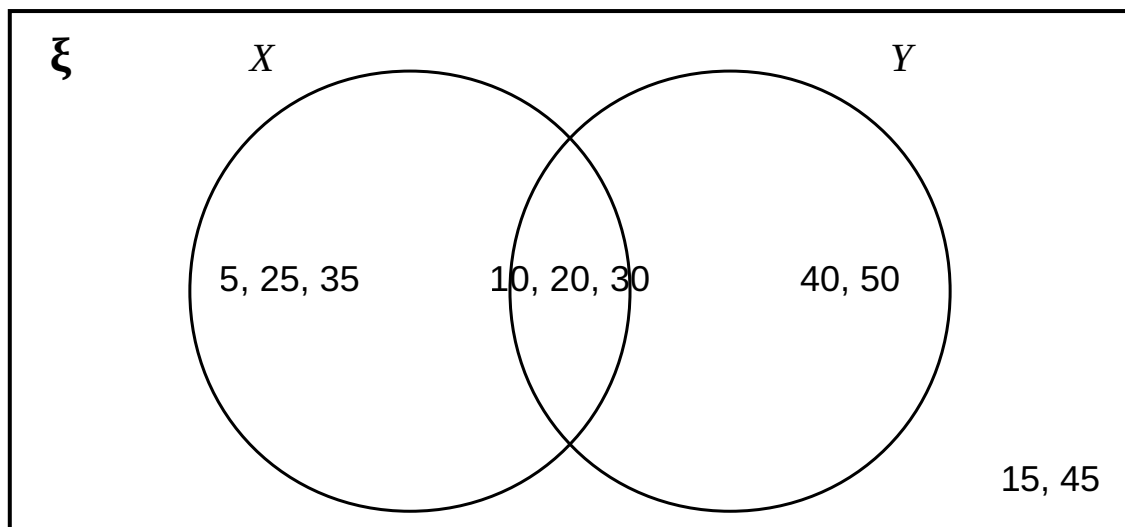
(ii) A'

One of the numbers in the Venn diagram is picked at random.

(b) Find the probability that this number is in set $A \cup B$.

PROBABILITY & STATISTICS: VENN DIAGRAMS**Best Guess Mastery Worksheet (Target Grade 5/6)****You Do 1**

Here is a Venn diagram showing sets X and Y .



(a) Write down the numbers that are in the set

(i) $X \cup Y$

.....

(ii) $X \cap Y'$

.....

One of the numbers in the Venn diagram is picked at random.

(b) Find the probability that this number is in set Y' .

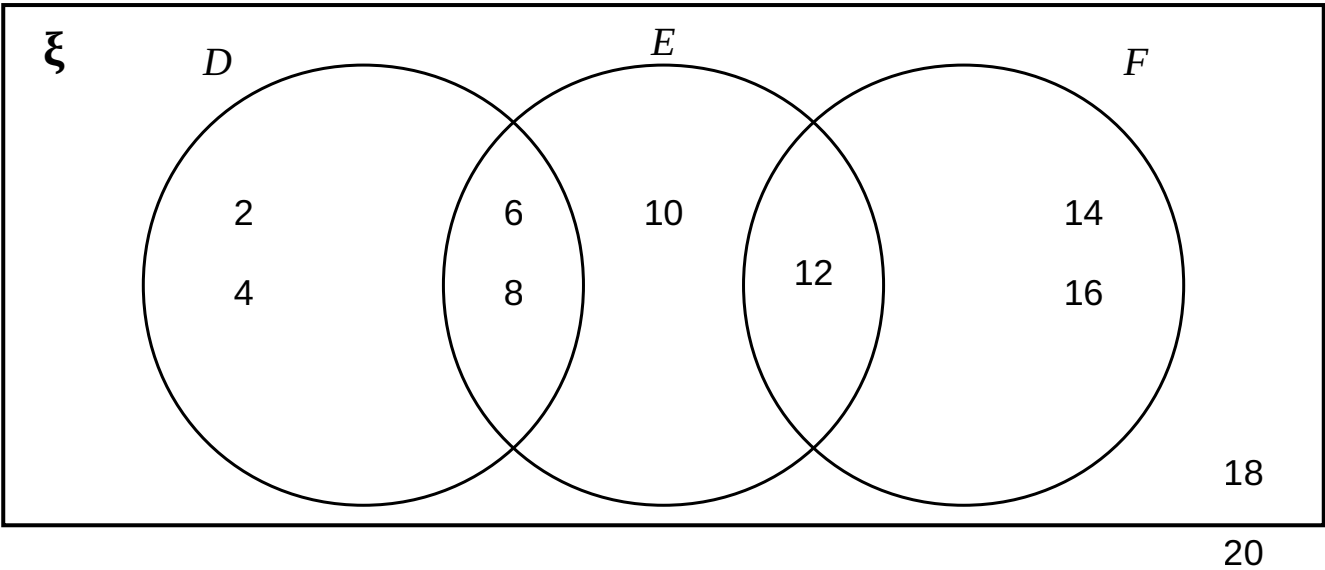
.....

PROBABILITY & STATISTICS: VENN DIAGRAMS

Best Guess Mastery Worksheet (Target Grade 5/6)

You Do 2

Here is a Venn diagram.



(a) Write down the numbers that are in the set

(i) E

.....

(ii) $D \cap F$

.....

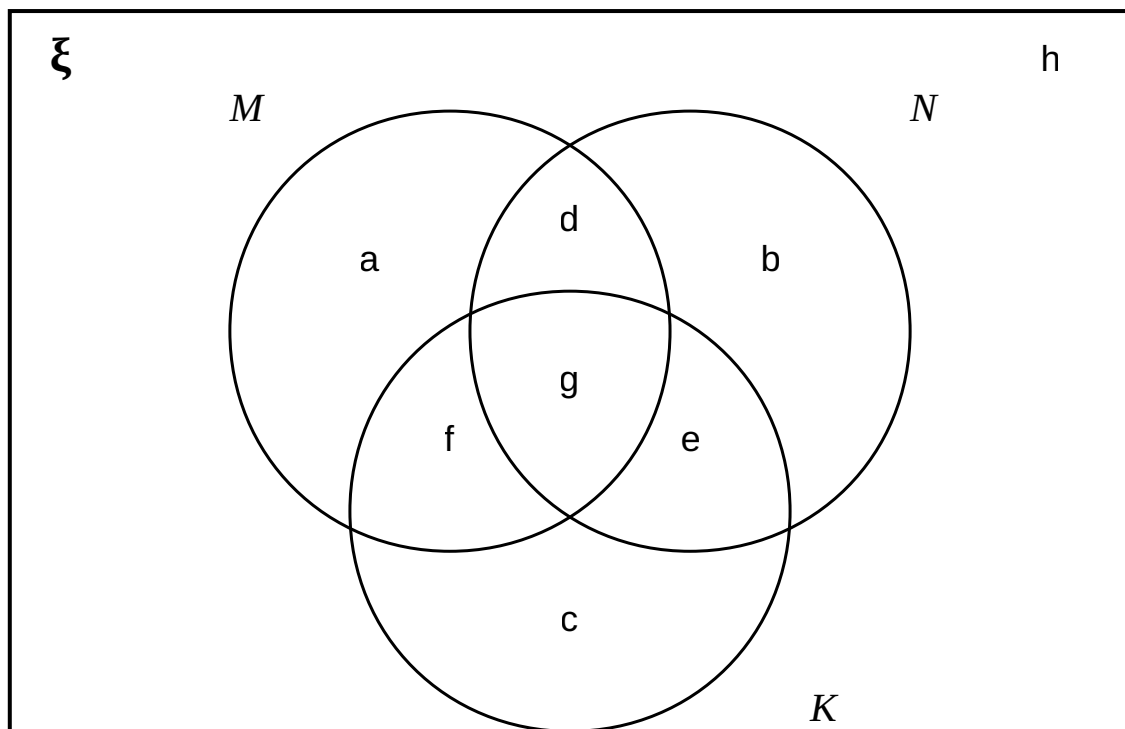
One of the numbers in the Venn diagram is picked at random.

(b) Find the probability that this number is in set $D \cup E \cup F$.

.....

PROBABILITY & STATISTICS: VENN DIAGRAMS**Best Guess Mastery Worksheet (Target Grade 5/6)****Challenge 1**

The Venn diagram shows the distribution of elements in sets M , N , and K .



- (a) List the elements that are in the set $(M \cup N)'$

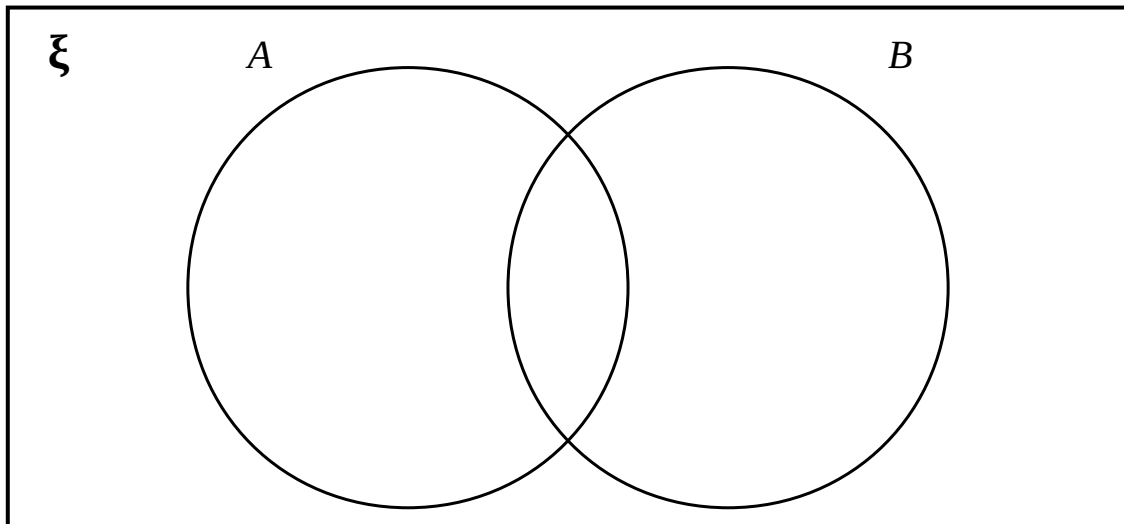
An element from the universal set ξ is chosen at random.

- (b) Find the probability that this element is in the set $M \cap K$.

PROBABILITY & STATISTICS: VENN DIAGRAMS (CONDITIONAL)**Best Guess Mastery Worksheet (Target Grade 5/6)****Challenge 2**

 $\xi = \{\text{integers from 1 to 10 inclusive}\}$ $A = \{\text{prime numbers}\}$ $B = \{\text{odd numbers}\}$

(a) Complete the Venn diagram to represent this information.



A number is chosen at random from the universal set ξ .

(b) Given that the chosen number is in set B , find the probability that it is also in set A .

.....

Answers & Worked Solutions

I Do:

(a) (i) $Q = 11, 13, 14, 15, 16$

(ii) $P \cup R = 10, 12, 14, 15, 16, 17, 19$

(b) **Yes.** Set P and Set R do not overlap in the diagram, meaning they share no common elements. Therefore their intersection is the empty set ($\emptyset$).

(c) Total numbers = 10. Numbers in Q' (outside Q) = 5 (which are 10, 12, 17, 18, 19). Probability = $5/10$ (or $1/2$).

We Do:

(a) (i) $A \cap B$ (the overlap) = **7, 9**

(ii) A' (everything outside A) = **2, 4, 6, 8, 10**

(b) Total numbers = 10. Numbers in $A \cup B$ (inside any circle) = 7. Probability = $7/10$.

You Do 1:

(a) (i) $X \cup Y$ (all elements in circles) = **5, 10, 20, 25, 30, 35, 40, 50**

(ii) $X \cap Y'$ (in X but NOT in Y, i.e., "X only") = **5, 25, 35**

(b) Total numbers = 10. Numbers in Y' (outside Y) = 5. Probability = $5/10$ (or $1/2$).

You Do 2:

(a) (i) $E = 6, 8, 10, 12$

(ii) $D \cap F$ (overlap of D and F) = $\emptyset$ (or write "none" / leave empty).

(b) Total numbers = 10. Numbers in $D \cup E \cup F$ (inside any circle) = 8. Probability = $8/10$ (or $4/5$).

Challenge 1:

(a) $(M \cup N)'$ means everything outside of circles M and N. This includes the "K only" region and the outside region. Elements = **c, h**.

(b) Total elements = 8. Elements in $M \cap K$ (overlap of M and K) = 2 (which are f, g). Probability = $2/8$ (or $1/4$).

Challenge 2:

(a) $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$. $A = \{2, 3, 5, 7\}$. $B = \{1, 3, 5, 7, 9\}$.

Intersection ($A \cap B$) = **3, 5, 7**.

A only = **2**.

B only = **1, 9**.

Outside circles = **4, 6, 8, 10**.

(b) Given it is in set B , the denominator is the number of elements in B , which is 5.

The number of those elements that are ALSO in A is 3.

Conditional Probability = **3/5**.