

Past Papers Worksheet P2 Sets IGCSE Mathematics 0580  
(Set Notations, Subset, Universal, Complement, Union, Intersection)



1.  $M = \{x : x \text{ is an integer and } 2 \leq x < 6\}$   
(i) Find  $n(M)$  [1]  
(ii) Write down a set  $N$  where  $N \subset M$  and  $N \neq \emptyset$ . [1]

0580/23/O/N/19 Q18 (a)

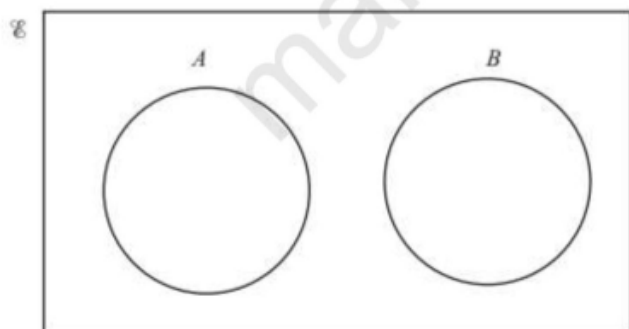
2.  $Q = \{1, 2, 3, 4, 5, 6\}$   
Write down a set  $P$  where  $P \subset Q$ . [1]

0580/21/O/N/17 Q15 (a)

3.  $\xi = \{x : 2 \leq x \leq 16, x \text{ is an integer}\}$   
 $M = \{\text{even numbers}\}$   
 $P = \{\text{prime numbers}\}$   
(i) Find  $n(M)$ . [1]  
(ii) Write down the set  $(P \cup M)'$ . [1]

0580/23/M/J/16 Q14 (a)

4.  $\xi = \{7, 9.3, \pi, 5/9, 2\sqrt{8}\}$



$A = \{\text{integers}\}$      $B = \{\text{irrational numbers}\}$

Write all the elements of  $\xi$  in their correct place on the Venn diagram. [2]

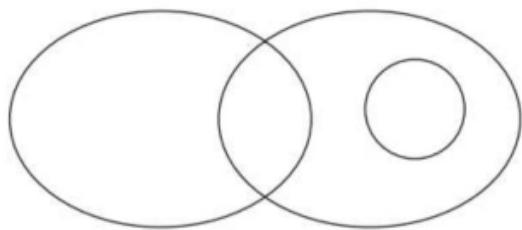
0580/23/O/N/16 Q20 )



5.  $Q = \{2, 4, 6, 8, 10\}$  and  $R = \{5, 10, 15, 20\}$ .

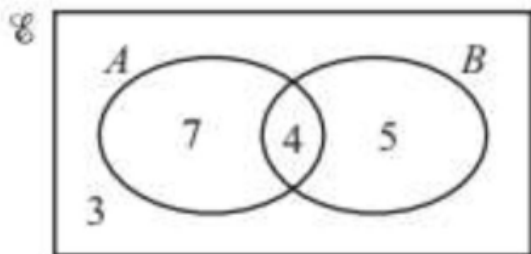
$15 \in P$ ,  $n(P) = 1$  and  $P \cap Q = \emptyset$ .

Label each set and complete the Venn diagram to show this information [3]



0580/21/M/J/10 Q12)

6. This Venn diagram shows the number of elements in each region.



Write down the value of  $n(A \cup B')$  [1]

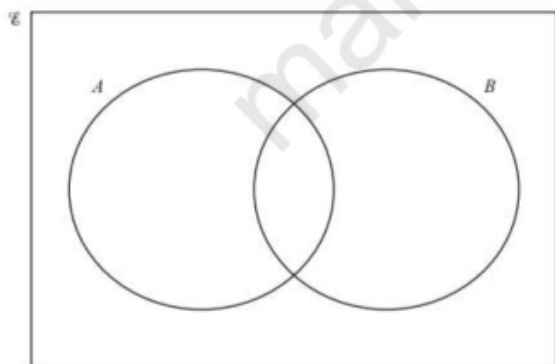
0580/23/M/J/11 Q3(b)

7.  $\xi = \{x : 1 \leq x \leq 10, \text{ where } x \text{ is an integer}\}$

$A = \{\text{square numbers}\}$

$B = \{1, 2, 3, 4, 5, 6\}$

(a) Write all the elements of  $\xi$  in their correct place in the Venn diagram [2]



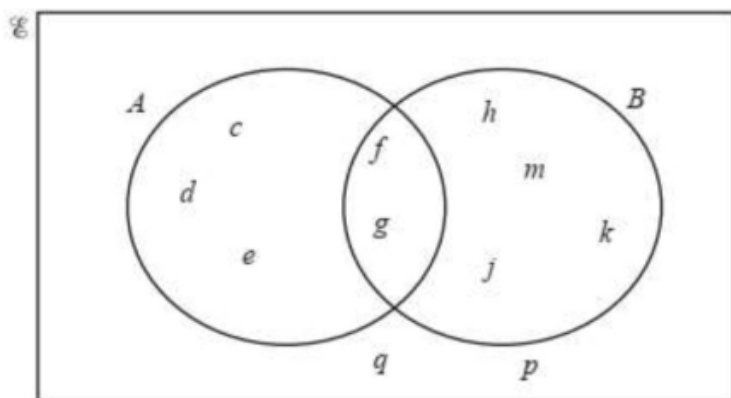
(b) List the elements of  $(A \cup B)'$ . [1]

(c) Find  $n(A \cap B')$ . [1]

0580/23/M/J/14 Q17)



8. The Venn diagram shows two sets, A and B.



(i) Use set notation to complete the statements.

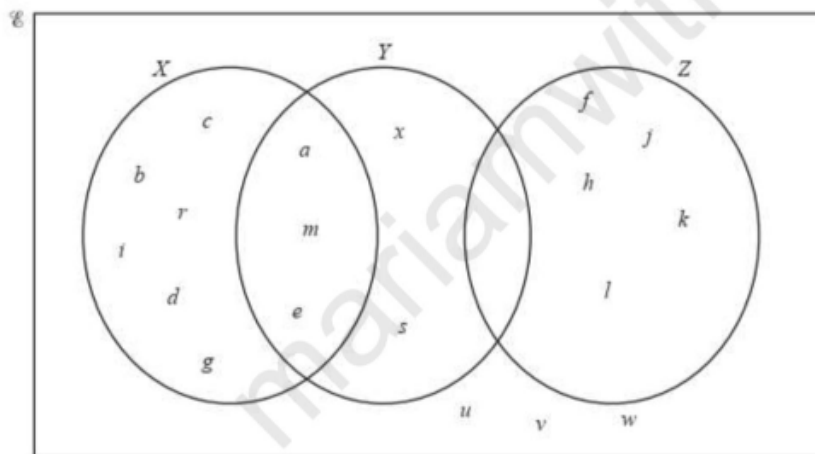
(a)  $d \dots\dots\dots A$  [1]

(b)  $\{f, g\} = \dots\dots\dots$  [1]

(ii) Complete the statement.  $n(\dots\dots\dots) = 6$  [1]

**0580/42/F/M/19 Q9**

9.



(a) Use set notation to complete the statements for the Venn diagram above.

(i)  $c \dots\dots\dots X$  [1]

(ii)  $\dots\dots\dots = \{a, m, e\}$  [1]

(iii)  $Y \cap Z = \dots\dots\dots$  [1]

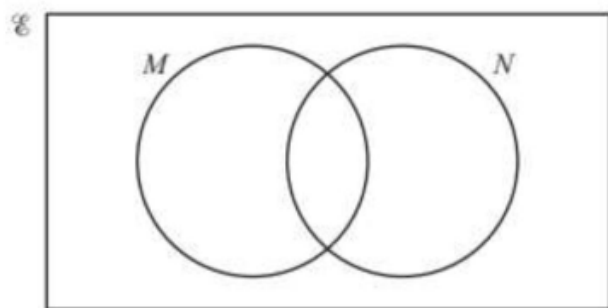
(b) List the elements of  $(X \cup Y \cup Z)'$ . [1]

(c) Find  $n(X' \cap Z)$ . [1]

**0580/22/F/M/18 Q19)**



10. You may use this Venn diagram to help you answer



$$\xi = \{x : 1 \leq x \leq 12, x \text{ is an integer}\}$$

$$M = \{\text{odd numbers}\}$$

$$N = \{\text{multiples of 3}\}$$

(i) Find  $n(N)$ . [1]

(ii) Write down the set  $M \cap N$ . [1]

(iii) Write down a set  $P$  where  $P \subset M$ . [1]

**0580/22/M/J/15**

11. (i)  $\xi = \{x : x \text{ is an integer and } 1 \leq x \leq 10\}$

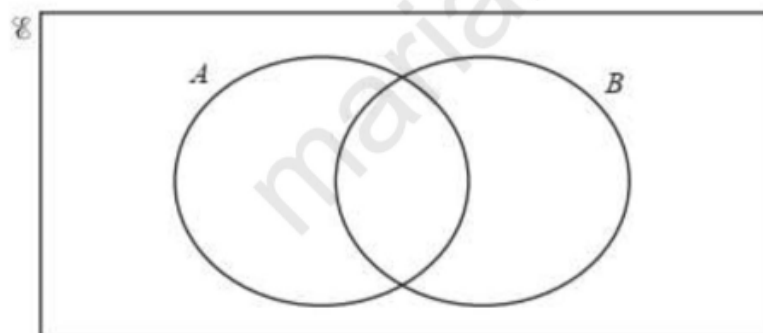
$$A = \{x : x \text{ is even}\}$$

$$4 \in A \cap B$$

$$n(A \cap B) = 1$$

$$(A \cup B)' = \{1, 7, 9\}$$

Complete the Venn diagram below using this information. [4]



(ii) Use your Venn diagram to complete the statement.

$$B = \{\dots\dots\dots\} \quad [1]$$

**0580/41/O/N/18 Q6**



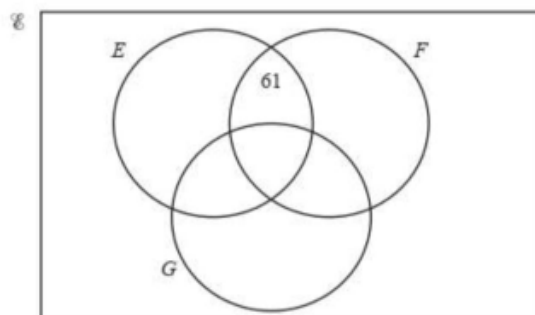
12.  $\xi = \{x : x \text{ is an integer and } 60 < x < 70\}$

$E = \{x : x \text{ is an odd number}\}$

$F = \{x : x \text{ is a prime number}\}$

$G = \{x : x \text{ is a square number}\}$

(i) Complete the Venn diagram below to show this information. [3]



(ii) Find  $n(E \cup F \cup G)'$ . [1]

(iii) Use set notation to complete the statement.

$E \cap F \cap G = \dots\dots\dots$  [1]

**0580/23/O/N/17 Q23**

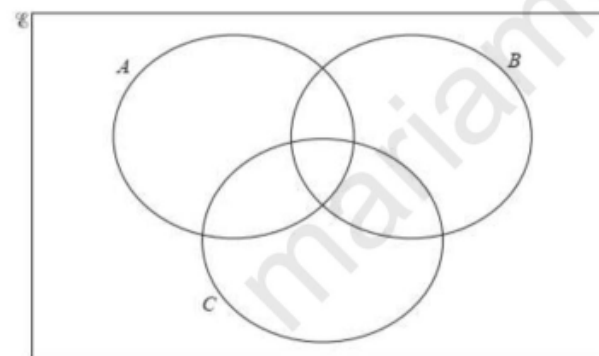
13.  $\xi = \{21, 22, 23, 24, 25, 26, 27, 28, 29, 30\}$

$A = \{x : x \text{ is a multiple of 3}\}$

$B = \{x : x \text{ is prime}\}$

$C = \{x : x \leq 25\}$

(a) Complete the Venn diagram. [4]



(b) Use set notation to complete the statements.

(i) 26 ..... B [1]

(ii)  $A \cap B = \dots\dots\dots$  [1]

(c) List the elements of  $B \cup (C \cap A)$ . [2]

(d) Find (i)  $n(C)$ , [1] (ii)  $n(B' \cup (B \cap C))$  [1]

(e)  $(A \cap C)$  is a subset of  $(A \cup C)$

Complete this statement using set notation.

$(A \cap C) \dots\dots\dots (A \cup C)$  [1]

**0580/43/M/J/17 Q10)**



14. (a)  $x$  is an integer.

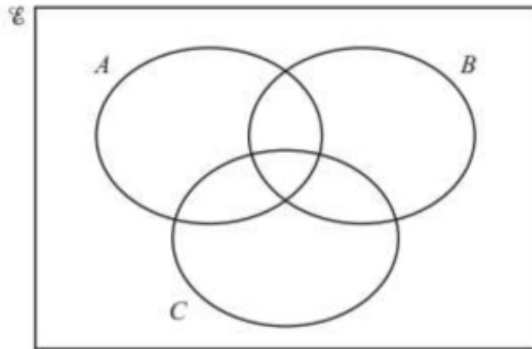
$$\xi = \{x: 1 \leq x \leq 10\}$$

$$A = \{x: x \text{ is a factor of } 12\}$$

$$B = \{x: x \text{ is an odd number}\}$$

$$C = \{x: x \text{ is a prime number}\}$$

(i) Complete the Venn diagram to show this information. [3]



(ii) Use set notation to complete each statement.

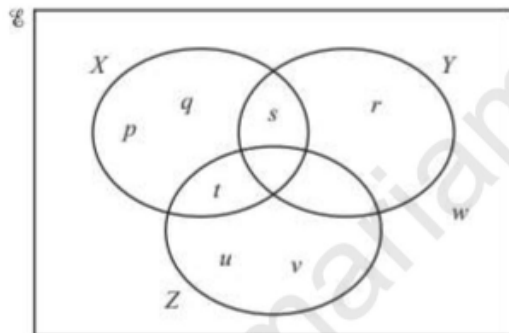
$$6 \dots\dots\dots A$$

$$A \cap B \cap C = \dots\dots\dots$$

$$A \cap A' = \dots\dots\dots [3]$$

(iii) Find  $n(B)$ . [1]

(b)



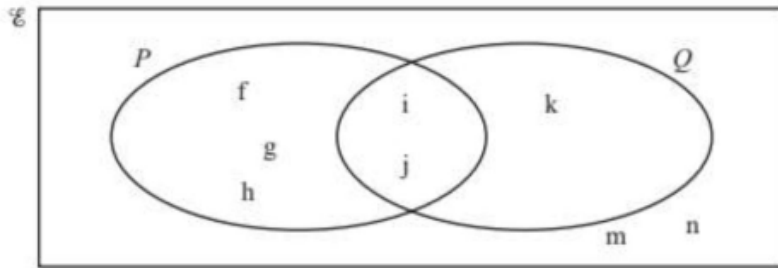
Use set notation to complete the statement.

$$\{u, v\} \dots\dots\dots Z [1]$$

0580/42/F/M/15 Q2)



15. (a) Use the information in the Venn diagram to complete the following.



(i)  $P \cap Q = \{ \dots \}$  [1]

(ii)  $P' \cup Q = \{ \dots \}$  [1]

(iii)  $n(P \cup Q)' = \dots$  [1]

(b) A letter is chosen at random from the set Q.

Find the probability that it is also in the set P. [1]

~~(c) On the Venn diagram shade the region  $P' \cap Q$ . [1]~~

(d) Use a set notation symbol to complete the statement.

$\{f, g, h\} \dots P$  [1]

**0580/22/M/J/14 Q22)**

16.  $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$E = \{x : x \text{ is an even number}\}$

$F = \{2, 5, 7\}$

$G = \{x : x^2 - 13x + 36 = 0\}$

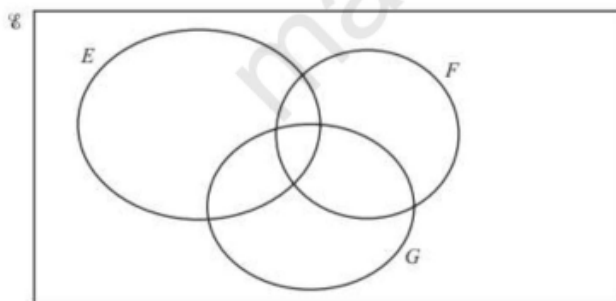
(a) List the elements of set E [1]

(b) Write down  $n(F)$ . [1]

(c) (i) Factorise  $x^2 - 13x + 36$ . [2]

(ii) Using your answer to part (c)(i), solve  $x^2 - 13x + 36 = 0$  to find the two elements of G. [1]

(d) Write all the elements of  $\xi$  in their correct place in the Venn diagram. [2]



(e) Use set notation to complete the following statements.

(i)  $F \cap G = \dots$  [1]

(ii)  $7 \dots E$  [1]

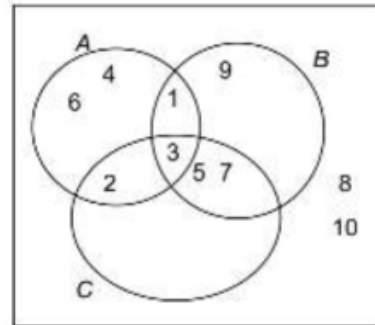
(iii)  $n(E \dots F) = 6$  [1]

**0580/41/M/J/12 Q8)**

## Answer

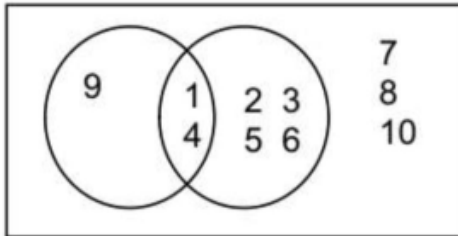
1) (i) 4 (ii) At least one and fewer than four numbers from {2, 3, 4, 5}	9) (a) (i) $\in$ (ii) $X \cap Y$ or (iii) $\emptyset$ (b) u, v, w (c) 5
2) Fewer than 6 elements from {1, 2, 3, 4, 5, 6} or $\emptyset$	10) Q20 (a) (i) 4 (ii) {3, 9} (iii) fewer than 6 numbers from {1, 3, 5, 7, 9, 11} or $\emptyset$
3) (i) 8 (ii) 9, 15	11) (b)(i) <div> </div>
4) <div> </div>	(b)(ii) 3 4 5
5) <div> </div>	12) (b)(i) <div> </div>
	(ii) 3 (iii) $\emptyset$ or { }
	13) (a) <div> </div>
	(b)(i) $\notin$ (ii) $\emptyset$ (c) 21, 23, 24, 29 (d)(i) 5 (ii) 9 (e) $\subset$ or $\subseteq$
6) 14	14) (a) (i)





(ii)  $\in$  cao  $\{3\}$   $\emptyset$  or  $\{ \}$  (iii) 5  
(b) (i)  $\subset$

7) (a)

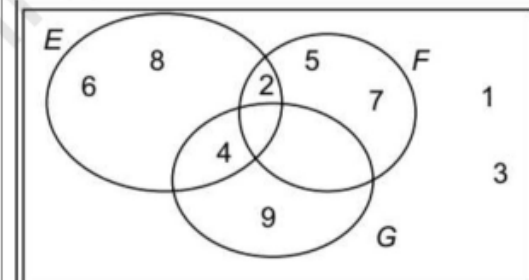


(b) 7 8 10 (c) 1

8 (i)(a)  $\in$  (b)  $A \cap B$  (ii)  $B$  or  $A'$

15) (a)(i)  $i, j$  (ii)  $i, j, k, m, n$  (iii) 2 (b)  $2/3$  (d)  
 $\subset$  or  $\subseteq$

16) (a) 2 4 6 8 (b) 3 (c)(i)  $(x - 4)(x - 9)$  (ii) 4  
& 9(d)



(e) (i)  $\emptyset$  or  $\{ \}$  cao (ii)  $\notin$  cao (iii)  $\cup$  cao