

2003

Question 2

Q2 (c) (i) $A = \{1,2,3,4\}$, $B = \{2,3,5\}$ and $C = \{1,3,4,5,6\}$.

List the elements of $(A \setminus B) \cup (C \cap B)$ and the elements of $(A \cup B) \cap (C \setminus B)$.

(ii) U is the universal set and P and Q are two subsets of U .

$$\#U = 20$$

$$\#(P \cap Q) = x$$

$$\#(P \setminus Q) = 2x$$

$$\#((P \cup Q)^c) = 4$$

$$\#Q = 2(\#P).$$

Represent the above information on a Venn diagram and hence find $\#Q$.

Solution

Q2 (c) (i) $A = \{1,2,3,4\}$, $B = \{2,3,5\}$ and $C = \{1,3,4,5,6\}$.

List the elements of $(A \setminus B) \cup (C \cap B)$ and the elements of $(A \cup B) \cap (C \setminus B)$.

$$A \setminus B = \{1,4\}$$

$$C \cap B = \{3,5\}$$

$$(A \setminus B) \cup (C \cap B) = \{1,3,4,5\}$$

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

$$C \setminus B = \{1,4,6\}$$

$$(A \cup B) \cap (C \setminus B) = \{1,4\}$$

(ii) U is the universal set and P and Q are two subsets of U .

$$\#U = 20$$

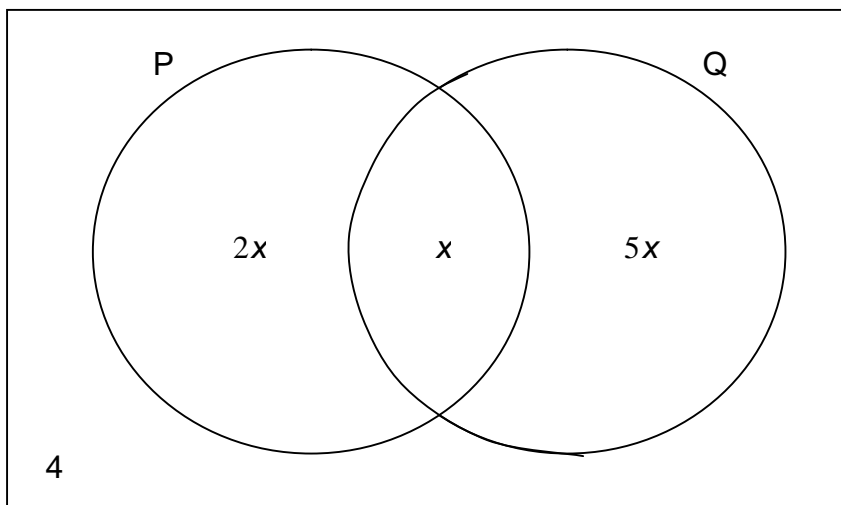
$$\#(P \cap Q) = x$$

$$\#(P \setminus Q) = 2x$$

$$\#((P \cup Q)') = 4$$

$$\#Q = 2(\#P).$$

Represent the above information on a Venn diagram and hence find $\#Q$.



$$\#Q = 2(\#P)$$

$$\#Q = 2(3x)$$

$$\#Q = 6x$$

$$2x + x + 5x + 4 = 20$$

$$8x = 16$$

$$x = 2$$

$$\#Q = 12$$