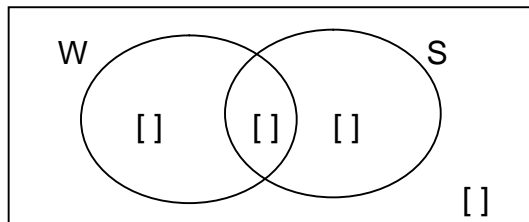


2004

Question 2

Q2 (c) (i) A leisure centre has 110 members. The weights room W is used by 82 members and the swimming pool S is used by 57 members. 15 members do not use either facility.



Copy the Venn diagram into your answerbook and complete it to show the number of members in each part of each set.

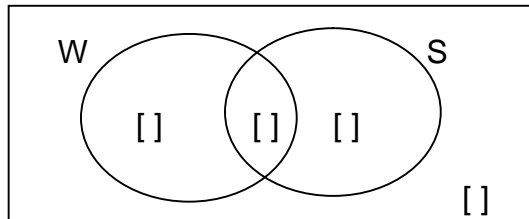
- (ii) U is the universal set and A and B are two subsets of U .
- $\#U = u$
 - $\#A = a$
 - $\#B = b$
 - $\#(A \cap B) = x$
 - $\#((A \cup B)) = y$.

Represent this information on a Venn diagram and hence express u in terms of, a , b , x and y .

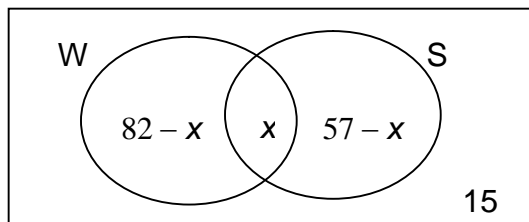
Show that if $a > b$, then the minimum possible value of u is $y + a$.

Solution

Q2 (c) (i) A leisure centre has 110 members. The weights room W is used by 82 members and the swimming pool S is used by 57 members. 15 members do not use either facility.



Copy the Venn diagram into your answerbook and complete it to show the number of members in each part of each set.

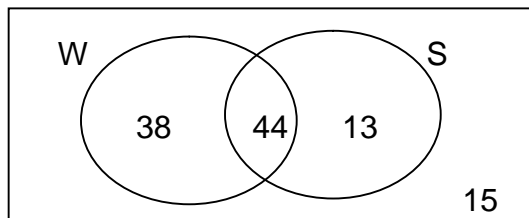


$$82 - x + x + 57 - x + 15 = 110$$

$$-x + 154 = 110$$

$$-x = -44$$

$$x = 44$$



(ii) U is the universal set and A and B are two subsets of U .

$$\#U = u$$

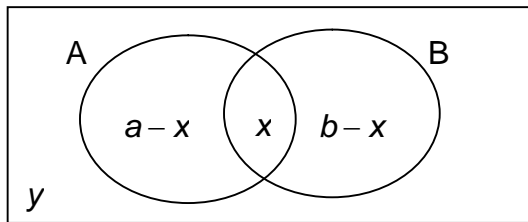
$$\#A = a$$

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Represent this information on a Venn diagram and hence express u in terms of, a , b , x and y .

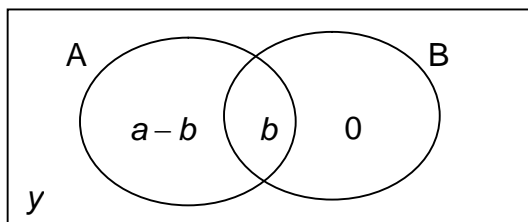


$$u = a - x + x + b - x + y$$

$$u = a + b - x + y$$

Show that if $a > b$, then the minimum possible value of u is $y + a$.

If $a > b$, then the maximum possible value we can put in the middle is b



$$u = a - b + b + y$$

$$u = a + y$$