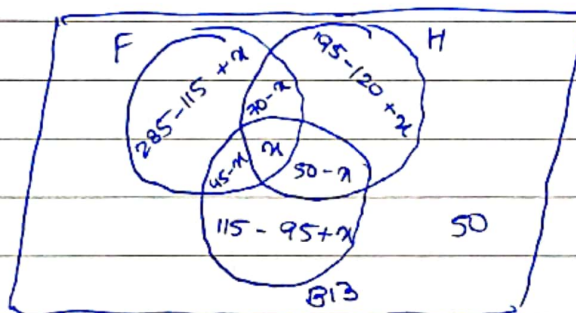


## SECTION - A

- Q2. 500 viewers  
 285 football  
 195 hockey  
 115 basketball  
 45 basketball + football  
 70 football + hockey  
 50 hockey + basketball  
 50 watch nothing

let  $x$  be no of viewers watching all 3



$$n(F \cup B \cup H) = 500 - 50 = 450$$

$$\therefore (285 - 115 + x) + (45 - x) + (70 - x) + x + (195 - 120 + x) + (50 - x) + (115 - 95 + x) = 450$$

$$\therefore x = 450 - (170 + 45 + 70 + 75 + 50 + 20)$$

$$\therefore \boxed{x = 20}$$

(i) 20 viewers watch all 3 games

(ii) viewers watching only football =  $170 + 20 = 190$

viewers watching only hockey =  $75 + 20 = 95$

viewers watching only basketball =  $20 + 20 = 40$

$\therefore$  no of viewers watching only one sport =  $190 + 95 + 40$

$$\boxed{= 325}$$

Q3 What is tautology, contradiction and contingency  
Prove that  $[(p \rightarrow q) \wedge \neg q] \rightarrow \neg p$  is a tautology.

Ans TAUTOLOGY: A tautology is a statement that is always true no matter what the input values are.

CONTRADICTION: A contradiction is a statement that is always false no matter what the input values are.

CONTINGENCY: A contingency is a statement whose truth table contains atleast one 'truth' and atleast one 'False'

P	q	$\neg p$	$\neg q$	$p \rightarrow q$	$(p \rightarrow q) \wedge \neg q$	Ans
T	T	F	F	T	F	T
T	F	F	T	F	F	T
F	T	T	F	T	F	T
F	F	T	T	T	T	T

Since the last column is 'T' in all cases,  
the statement  $[(p \rightarrow q) \wedge \neg q] \rightarrow \neg p$  is a tautology