ASBAT EDUCATIONAL CONSULT

MATHEMATICS
LESSON NOTES TERM 1 2024
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P.7

WEEK ONE

TOPIC: SETS

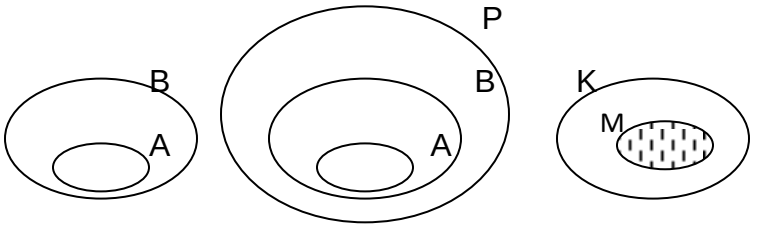
SUB TOPIC: SUBSETS

CONTENT:

Meaning of subsets

Symbol used on subsets

Subsets on Venn diagram



ACB ACBCP Set M∩K

Formation of subsets:

If set x ={1, 2, 3} List all the subsets of set x.

{1}, {2}, {3}, {12}, {1,3}, {2,3}, {1,2,3}

List all the proper subsets of R where R = {-3<n<+1} where n is an integer.

Solution:

R = {-2, -1, 0}

Proper subsets: { } {-2}, {-1}, {0}, {-2 -1}, {-2,0}, {-1, 0}

(i) Calculation of the number of subsets.=2^n

(ii)Calculation of number of proper subsets using formula = $2^n - 1$

Example: Find the number of subsets in set Q where Q = {4, 2, 9}

Number of subsets = 2^n where n = number of elements in a set.

Number of subsets of set Q = $2^n = 2^3 = 2 \times 2 \times 2 = 8$

EVALUATION ACTIVITY:

(a) If n(K) = 2, find number of subsets of K.
(b) If M = {d, e} find the number of proper subsets in set M.
(c) Given that set P={1,2,3,5,7,9} and set Q={1,2,3,4,6,8}.Find the number of proper subsets in(P∩Q)'.

WEEK TWO
LESSON ONE

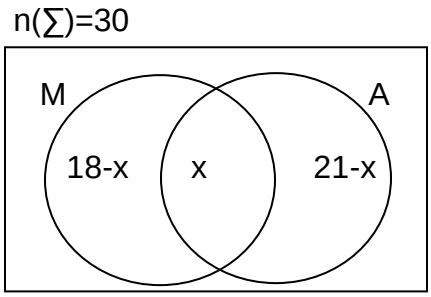
TOPIC SETS

APPLICATION OF SETS

Examples

1. In a class of 30 pupils 18 like music (M), 21 like Art (A) and some like both.

(a) Represent the above information on a Venn diagram.



(b) How many pupils like both subjects?

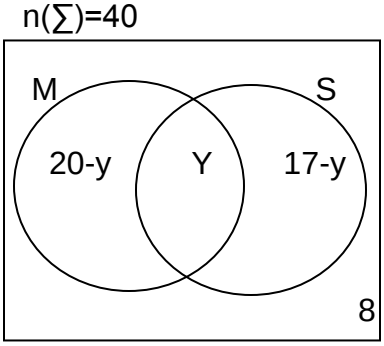
Solution

18-x + x +21 – x = 30
18+21-x =30
39-x=30
39-39-x =30-39
-x= -9
$\frac{-x}{-1} = \frac{-9}{-1}$
X = 9

:. 9 Pupils like both subjects

2. In a class of 40 pupils, 20 like mathematics (M), 17 like science (S), 'x' like both subjects while 8 do not like any of the subjects.
   (a) Represent the above information on a Venn diagram.

Solution



b)How many pupils like both subjects?

Solution

8+20-x+ x +17- x = 40

28+17-x = 40

45-x = 40

45-45-x = 40-45

-x = -5

$\frac{-x}{-1} = \frac{-5}{-1}$

X = 5

:. 5 Pupils like both subjects

c) What is the probability of selecting a pupil who likes only one subject?

Solution

(20 –x) + (17 – x)

(20-5) + (17-5)

15 +12

= 27

Prob (only one subject) = $\frac{27}{40}$

Activity

1. In a team of 16 students, 10 play football, 8 play tennis and some play both games. Use a Venn diagram,

(i) Find number of students who play both games.

(ii)Find number of students who play only one type of game.

2.In a class of 70 pupils,44 like Physics,36 like Georgraphy,17 like both subjects while p like neither of the two subjects.

(i)Show the given information on the Venn diagram.

(ii)Find the value of p.

(iii)How many pupils like one subject?

REFERENCES

Fountain primary maths Book 7 pages 16 to 17

MK Book 7 pages 10 to 11

Understanding math Book 7 page 9

Macmillan Book 7 page 9

Functional math Book 7 pages12

LESSON TWO

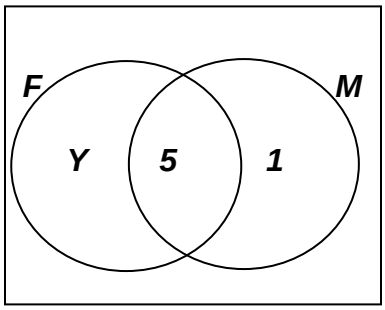
SOLVING PROBLEMS USING VENN DIAGRAMS GIVEN THE UNKNOWN IN THE "DIFFERENCE" REGION

Example 1

In a family of 10 members, 6 members eat meat (M), 5 members eat both meat and fish (F) while 'Y' members eat only fish.

(a) Represent the above information on a Venn diagram

Solution n(∑)=10



(b) How many members eat only fish?

Solution

y + 5 + 6 – 5 = 10
y + 6 + 5 – 5 = 10
Y + 6 = 10
y + 6 – 6 = 10 – 6
Y = 4

y + 6 = 10
y + 6 – 6 = 10 – 6
Y = 4

(c) Find the number of pupils who eat fish.

Solution

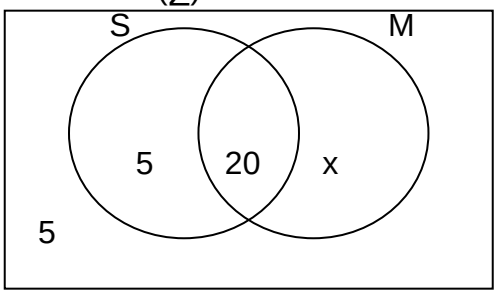
(y + 5) Pupils
4 + 5
9 Pupils

Examples 2

In a class of 60 pupils, 25 like swimming (s), x pupils like music (m) only, 20 like both swimming and music and 5 like none of these.

(a) Represent this information on the Venn diagram.

Solution n (∑) =60



(b) Find the value of x.

Solution

x + 5 + 20 + (25 – 20) = 60
x + 25 + 5 = 60
x + 30 = 60
x + 30 – 30 = 60 – 30
x = 30

(c) How many pupils like only one type of the activities?
Solution
x + (25 – 20)
30 + 5
35 pupils

Activity

1. In a class of 29 pupils,9 eat fish only,5 eat both fish and meat and y pupils eat meat only
(i)Show the above information on the Venn diagram.
(ii)Find the value of y.
2. At a party, 120 guests attended.50 took coke(C),g took Fanta(F) only,40 took both coke and Fanta while 10 took none of these.
(a)Represent the above information on the Venn diagram.
(b)Find the value of g.
(c)How many guests took one type of soda only?

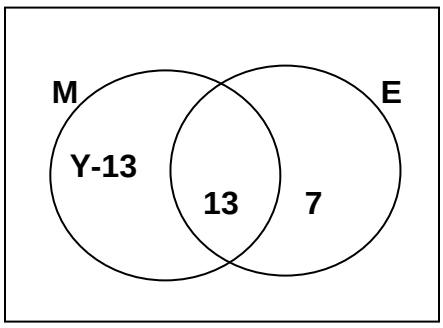
REFERENCES

Fountain primary maths Book 7 pages 16 to 17
MK Book 7 pages 10 to 11
Understanding math Book 7 page 9
Macmillan Book 7 page 9
Functional math Book 7 pages12

LESSON THREE
SOLVING PROBLEMS USING VENN DIAGRAMS GIVEN ONE OF THE SETS AS UNKNOWN

In a class of 35 pupils, y like mathematics (M), 20 like English (E) while 13 like both subjects.

(a) Using a Venn diagram, show the above information
Solution n(∑)=35



(b)Find the number of pupils who like mathematics.

Solution

y – 13 + 13 + 20 – 13 = 35 **OR**

y + 7 = 35

y + 7 - 7 = 35 – 7

y =28

y + 20 – 13 = 35

y + 7 = 35

y + 7 – 7 = 35 – 7

y = 28

OR

y – 13 + 20 = 35

y + 7 = 35

y + 7 – 7 =35 -7

y = 28

28 Pupils like mathematics

Activity

1. In a class 12 pupils, y like beans (B), 7 pupils like Posho (P) while 3 pupils like both.
   (a)Show the above information on the Venn diagram.
   (b)Find the value of y
2. In a class of 70pupils, 44 like maths, 17 like both subjects and some pupils like English.
   (a)Show the above information on the Venn diagram.
   (b)How many pupils like English?

REFERENCES

Fountain primary maths Book 7 pages 16 to 17
MK Book 7 pages 10 to 11
Understanding math Book 7 page 9
Macmillan Book 7 page 9
Functional math Book 7 pages12

LESSON FOUR

SOLVING PROBLEMS USING VENN DIAGRAMS.

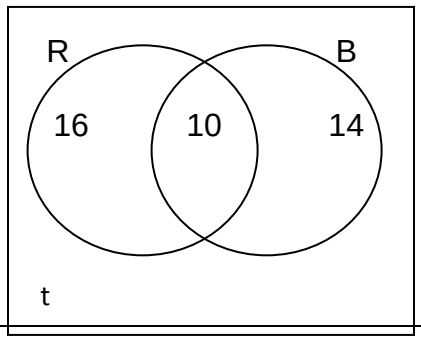
WHEN THE COMPLEMENT OF THE UNION IS NOT GIVEN

Example 1

In a village with 60 farmers, 26 grow rice, 24 grow beans, and 10 grow both crops while t grow none of the above.

(a) Represent the above information on a Venn diagram.

Solution n (∑) =60



b) Find the value of t .

Solution

t + 16 + 10 + 14 = 60

t + 40 = 60

t + 40 – 40 = 60 – 40

t = 20

Activity

1. In a class of 32 students.17 play football (F), 19 play tennis (T), 11 pupils play both football and tennis while k pupils play neither of the two games.

(a)Represent the above information on the Venn diagram.

(b)How many pupils do not play any of the two games?

2. In a class 45 students, 18 of them play tennis, 35 play football. If 15 play both games, how many play neither?

REFERENCES

Fountain primary maths Book 7 pages 16 to 17
MK Book 7 pages 10 to 11
Understanding math Book 7 page 9
Macmillan Book 7 page 9
Functional math Book 7 pages12

LESSON FIVE

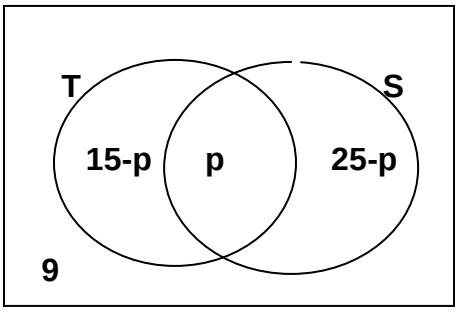
SOLVING PROBLEMS USING VENN DIAGRAMS WHEN ONE OF THE SETS IS THE UNIVERSAL

In a group of 40 people, they all play football, 9 play football only, 15 play tennis, 25 swim and some enjoy all the three games.

(a) Draw a Venn diagram to represent the above information

Solution

n(F)=40



(b) How many people participate in all the three activities?

Solution

15 – p + p + 25 – p + 9 = 40

15 + 25 – p + 9 = 40

49 – p = 40

49 – 49 – p = 40 -49

-p = -9
-p = -9
-1 -1
P = 9

Activity
1. In a class of 32 pupils, all of them eat fish (F).19 eat meat (M), 17 eat chicken(C), 11 eat all the three types of food while k eat fish only.
Use the Venn diagram to find:
(i)the number of pupils who eat only two types of food.
(ii)the number of pupils who eat fish only.

REFERENCES

Fountain primary maths Book 7 pages 16 to 17
MK Book 7 pages 10 to 11
Understanding math Book 7 page 9
Macmillan Book 7 page 9
Functional math Book 7 pages12

WEEK THREE
LESSON ONE

SHARING IN RATIOS GIVEN TOTAL SHARE

Example 1
Share 18 mangoes in the ratio of 4:5.

Solution	1st share	2nd share
Total ratio	(4 x 18²) mangoes	(5 x 18²) mangoes
4 + 5	9	9
9	(4 x 2) mangoes	(5 x 2) mangoes
	8 mangoes	**10 mangoes**

Example 2
Sh. 60,000 was shared among three sisters, Anne, Betty and Claire in the ratio 1:2:3 respectively.
How much did each get?

Solution	Anne's share	Betty share	Claries share
Total ratio.	10000	10000	10000
1 + 2 + 3	1 x 60000/=	2 x 60000/=	3 x 60000/=
=6	6	6	6
	1 x 10000/=	2 x 10000/=	3 x 10000/=
	10000/=	***20000/=***	***30000/=***

Activity
1. Share 360 mangoes in the ratio of 2:3
2. Sh.3000 is shared in the ratio of 3:7.What is the smaller share?
3. Share sh.450 cakes in the ratio of 5:4
4. sh. 1000 was shared between A and B in the ratio of 2:3. How much does each get?

REFERENCES

Fountain primary maths Book 7 pages 107 to 115
MK Book 7 pages 95 to 100
Understanding math Book 7 pages 128 to 144
Primary math Book 7 page 63
Functional math Book 7 pages 105 to 109

LESSON TWO

SHARING IN RATIOS GIVEN THE SHARE OF ONE PERSON.

Example 1

Paul and James shared some money in the ratio of 3:5 respectively. If James got 3000/= ,

(a) Find Paul's share

Solution

Paul : James
3 : 5
? : **3000/=**

5 parts represent 3000/=
1 part represent $\frac{3000}{5}$/= x 3
3 part represent $\frac{3000}{5}$/= x 3
= 600/= x 3

= 1800/=

(b) What was their total share?

Solution

Pupils share = 1800/=
James' share = 3000/=
Total share = 4800/=

OR Let x represent total share

$\frac{5}{8}$ x X = 3000/= x 8

8 x $\frac{5x}{8}$ = 3000/= x 8
5x = $\frac{3000}{5}$/= x8
X = 600 x 8
X = 4800/=

ACTIVITY

1. . A, B and C contributed money for a business in the ratio of 3:4:5 respectively, if C contributed sh.10,000 ,how much did the rest contribute?

2. At a party, the ratio of number of bottles of sodas to the number of bottles of beer is 5 to 3. If there are 24 beer bottles, how many soda bottles are there?

REFERENCES

Fountain primary maths Book 7 pages 107 to 115
MK Book 7 pages 95 to 100
Understanding math Book 7 pages 128 to 144
Primary math Book 7 page 63
Functional math Book 7 pages 105 to 109

$\frac{1}{4}$ $\frac{1}{3}$