

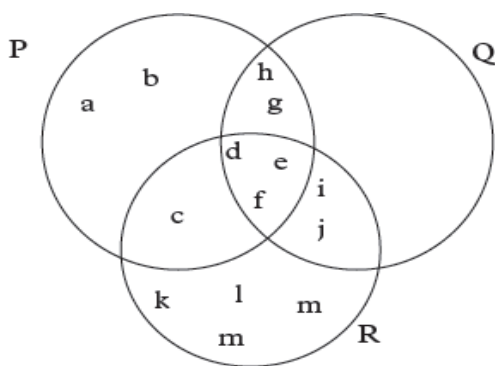
**E.S.M . ADELAIDE**

**KAMONYI DISTRICT**

**Facilitator; Habimana Noel(0788895153)**

**MODEL QUATIONS OF MATHEMATICS S1 ALL**

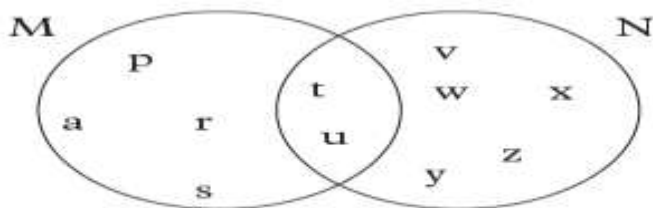
1. With using example define a set
2. List down the set G of vowels in the word " algebra"
3. A set C has 5 elements .How many subsets does it have
4. Given set  $B = \{a, b, c, d\}$  and  $D = \{1, a, 2, b, 3\}$  list all the subsets of set B and set D
5. Given sets  $J = \{1, 2, 3, 4\}$ ,  $K = \{2, 3, 5, 7\}$ ,  $L = \{1, 2, 5, 8\}$ ,  $M = \{3, 4, 5, 8\}$  and  $N = \{9, 10\}$ ,  
Find:  
(a)  $J \cap L$  (b)  $J \cap K$   
(c)  $K \cap L$  (d)  $M \cap N$   
(e)  $J \cap K \cap L$  (f)  $K \cap L \cap M$
6. Given sets  $A = \{2, 4, 6, 8, 10, 12\}$ ,  $B = \{3, 6, 9, 12, 15\}$  and  $C = \{9, 10, 11, 12, 13, 14, 15, 16, 17\}$ , draw Venn diagrams to represent the following sets:  
(a)  $A \cap B$  (b)  $A \cap C$   
(c)  $B \cap C$  (d)  $A \cap B \cap C$
7. Look at the Venn diagram below.



Write down the elements in:

- (a)  $P \cap Q$  (b)  $R \cap Q$
8. Set  $A = \{a, b, c, d, e, f, i, j\}$  and set  $B = \{a, e, i\}$ . Draw a Venn diagram.

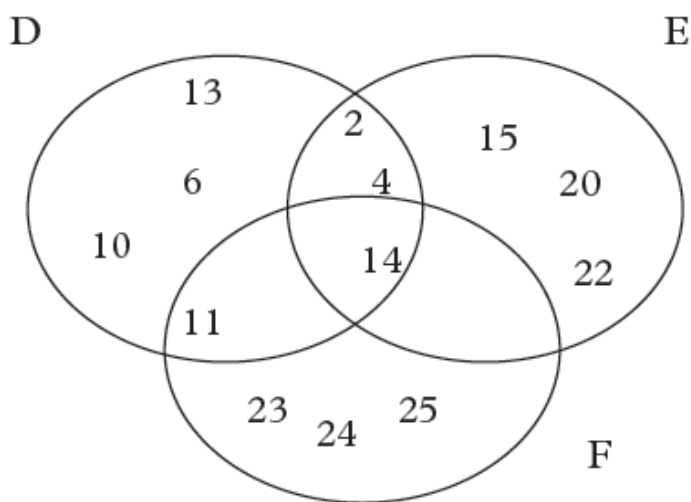
Consider the Venn diagram below.



List the elements of set M and N.

What are the elements of  $M \cap N$ .

Consider the Venn diagram below.



(a) List the elements of sets D, E and F.

(b) List the elements of:

(i)  $D \cap E$  (ii)  $D \cap F$  (iii)  $E \cap F$  (iv)  $D \cap E \cap F$

9. Find the cartesian products of the following sets:

(a) Set A(a, b), Set B(2, 3)

(b) Set C(m, n), Set F (5, 6, 7)

(c) Set D(p, q, r), Set E(1, 2, 3)

10. Write in set notation the relation between the following pair of sets

Set A = {2, 3, 4}, Set B {4, 6, 8}

11. Given the domain = {0, 1, 2, 3, 4, 5}, list the elements of the range and draw the graph to represent the given relation in each case.

(a) Multiply by 3.

(b) Multiply by 2 and add 1.

(c) Multiply by 3 and subtract 2.

12. Draw a graph for the relation  $x \rightarrow 4x$  for the domain  $\{0, 1, 2, 3, 4\}$ .
13. Given the domain  $\{x : -3 \leq x \leq 3\}$ , use the relation "square" to list the element of the domain and the range. Map the relations.
14. If  $P = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ , write down the ordered pair to illustrate each of the relation Q on set P.
- (a)  $Q: x \rightarrow x^2$
- (b)  $Q: x \rightarrow x + 5$
- (c)  $Q: x \rightarrow x - 3$
15. Find the inverse of the following functions
1.  $f(x) = x - 6$
  2.  $f(x) = x + 2$
  3.  $g(x) = 2x + 3$
  4.  $g(x) = 3x - 1$
  5.  $f(x) = x^2 + 2$
  6.  $f(x) = 3x^2 - 1$
  7.  $h(x) = 2x$
  8.  $h(x) = 4 - 9x^2$
  9.  $h(x) = 12x$
  10.  $f(x) = 13x^2 - 1$
  11.  $g(x) = x$
  12.  $g(x) = 1x$
17. Given the function  $f(x) = 4x$  and  $g(x) = x - 2$ , find:
- (a)  $gf(x)$  (b)  $fg(x)$
18. Given that  $f(x) = 3x - 1$  and  $g(x) = 2x + 5$ , find:
- (a)  $fg(x)$  (b)  $gf(x)$
19. If  $g(x) = xz$  and  $f(x) = 3x$ , find: (a)  $gf(x)$  (b)  $fg(x)$
20. Given the following functions, find  $fg(x)$ :
- (a)  $f(x) = 2x$ ,  $g(x) = x + 3$
- (b)  $f(x) = 2x + 1$ ,  $g(x) = x - 3$
- (c)  $f(x) = x - 1$ ,  $g(x) = 2x^2 - 3$
- (d)  $f(x) = x^2 - 1$ ,  $g(x) = x + 1$
21. Given that  $f(x) = 3x + 4$  and  $g(x) = x - 1$ , find:
- (a)  $fg(x)$  (b)  $gf(x)$
- (c)  $gf(2)$
22. If  $f(x) = x^2 + 1$  and  $g(x) = 2x$ , find:
- (a)  $fg(x)$  (b)  $gf(x)$
- (c)  $gf(2)$  (d)  $fg(2)$
23. If  $f(x) = 3x$  and  $g(x) = x^2 + 3$ , find the value of  $x$  for which,  $gf(x) = fg(x)$ .
24. If  $f(x) = 2x + 3$  and  $g(x) = 3x$ , find  $fg(x)$ .
25. The function  $f(x) = 2x - 1$  and  $g(x) = x + 5$ , find  $fg(x)$ .
26. Given that  $f(x) = 3x + 1$ ,  $g(x) = 2x - 5$  and  $h(x) = x^2 - 4$ , find:
- (a)  $fgh(x)$  (b)  $hgf(x)$
27. If  $f(x) = 3x + 1$ , find  $f_2(x)$ .
28. The function  $f(x) = 2x - 5$ , find  $f_2(x)$ .

29. Given that  $\varepsilon = \{-4 \text{ to } +22\}$ , show on a Venn diagram the subsets P, E and D.

Given that  $P = \{\text{prime numbers}\}$

$E = \{\text{even numbers}\}$

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

30. Given  $\varepsilon = \{-6 \text{ to } +28\}$  and

Sets  $E = \{\text{even numbers}\}$ ,  $D = \{\text{odd numbers}\}$  and  $N = \{\text{natural numbers}\}$

$P = \{\text{prime numbers}\}$

show in a Venn diagram

(a) subsets E, D and N

(b) subsets P, D and N.

31. Work out the following fractions

(a)  $\frac{1}{4} + \frac{1}{3}$

(b)  $\frac{2}{5} + \frac{1}{5}$

(c)  $\frac{3}{5} + \frac{2}{3} + \frac{4}{9}$

(d)  $1\frac{1}{3} + 3\frac{1}{2}$

(e)  $2\frac{4}{5} + 1\frac{6}{7}$

32. Work out the following fractions

(a)  $(2\frac{1}{2} \div 1\frac{1}{2}) + \frac{2}{3}$

(b)  $2\frac{1}{2} + (\frac{3}{4} \times 1\frac{1}{4}) - 1\frac{1}{8}$

(c)  $(2\frac{1}{2} \div 7\frac{1}{2}) + \frac{1}{4}$

(d)  $2\frac{1}{2} \div \frac{4\frac{1}{3} - 2\frac{1}{2}}{4\frac{1}{6}}$

(e)  $\frac{3\frac{1}{2} - 1\frac{5}{6} \times \frac{3}{11}}{1\frac{3}{4} + 7\frac{2}{3} \div 3\frac{5}{6}}$

33. Express the following fractions into decimals

(a)  $\frac{3}{8}$

(b)  $\frac{8}{9}$

(c)  $\frac{1}{7}$

(d)  $\frac{4}{9}$

(e)  $\frac{7}{12}$

(f)  $\frac{10}{7}$

(g)  $\frac{5}{4}$

(h)  $\frac{13}{10}$

34. Convert the following decimals to fractions.

(a) 0.2

(b) 0.62

(c) 0.012

(d) 0.001

(e) 1.4

(f) 1.2

35. Convert the following recurring decimals to fractions.

(a)  $0.\dot{5}$

(b)  $0.7\dot{2}$

(c)  $0.1\dot{3}$

(d)  $0.\dot{7}1\dot{7}$

(e)  $0.1\dot{2}$

(f)  $0.48\dot{6}$

(g)  $0.303\dot{8}$

(h)  $1.1\dot{3}$

36. Write down a set of all prime numbers less than 30.

37. Use the following number lines to determine the results.

(a)

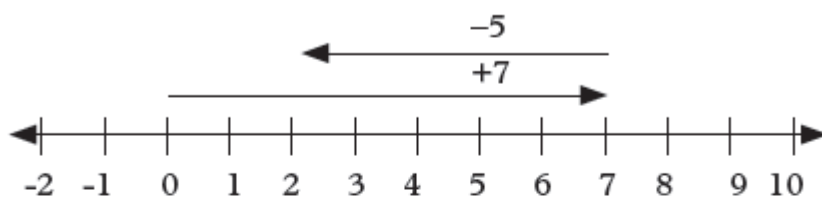


Fig. 2.28

(b)

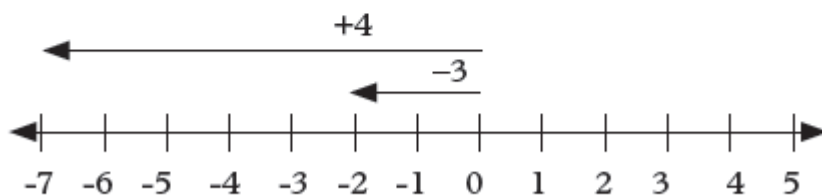


Fig. 2.29

38. Find the values of;

(a)  $\{9 + (-2) \times (-15)\} \times (-2 + 7) \div 3$

(b) 
$$\frac{-6 + (-5) + 8 \times -2}{-4 + (-2)}$$

(c)  $-3 \times 23 + (-5) \times (-1) - 8 \times (-4)$

(d) 
$$\frac{9 \times -2}{-4 - (-2)}$$