MATHEMATICS

CLASS-XI

SETS

1. Which of the following are sets? Justify your answer.

i. The collection of all the months of a year beginning with the letter M.

Ans. The collection of all the months of a year beginning with the letter M is a well defined collection of objects because one can definitely identify a month that belongs to this collection.

A= {march,may}

Hence this is a set.

ii. The collection of all the difficult chapters in this book.

Ans. As the collection of all difficult chapters in this book may vary from person to person.

Hence this is not a set.

HOME WORK

NCERT BOOK: EX-1.1 -1(i,iii,iv,v).

2. Let A={1,2,3,4,5,6}. Insert the appropriate symbol $\in$ or $\notin$ in the blank spaces.

i. 2 . . .A

Ans. $2 \in A$

ii. 0 . . . A

Ans. $0 \notin A$

HOME WORK

a. 6 . . . A
b. 10 . . .A

3. Write the following sets in roster form:

i. A={x:x is an integer and $-2 \leq x < 5$}

Ans. The elements of this set are -1,-2,0,1,2,3 and 4 only.

Therefore, The given set can be written in roster form as,

A={-2,-1,0,1,2,3,4}

ii. B={x:x is a two digit natural number such that the sum of its digits is 4}.

Ans. The elements of this set are 13,22 and 31 only.

Therefore, the given set can be roster form as,

B={13,22,31}

iii. A= The set of all letters in the word MATHEMATICS.

Ans. There are 11 letters in the word MATHEMATICS, out of which letters M,A and T are repeated.

Therefore, the given set can be roster form as,

A={M,A,T,H,E,I,C,S}

HOME WORK

NCERT BOOK: EX-1.1-3(i,ii,iii,iv).

4. Write the following sets in the set builder form:

i. {5,25,125,625}

Ans. It can be seen that $5=5^1$,$25=5^2$,$125=5^3$ and $625=5^4$.

Therefore, {5,25,125,625}={x:x=5^n, n N and 1≤n≤4}

HOME WORK

a. {3,6,9,12}
b. {2,4,8,16,32}

5. List all the elements of the following sets:

i. A={x:x is an odd natural number}

Ans. A={x:x is an odd natural number}={1,3,5,7,…}

HOME WORK

NCERT BOOK: EX-1.1-5(iii, iv,v).

6. Match each of the set on the left in the roster form with the same set on the right described in set-builder form:

i.	{1,2,3,6}	a. {x:x is a prime number and a divisor of 6}
ii.	{2,3}	b.{x:x is an odd natural number less than 10}
iii.	{M,A,T,H,E,M,A,T,I,C,S}	c.{x:x is natural number and divisor of 6}
iv.	{1,3,5,7,9}	d.{x:x is a letter of the word MATHEMATICS}

Ans. i match with c

ii match with a

iii match with d

iv match with b

7. Which of the following are examples of the null set:

i. {y:y is a point common to any two parallel lines}

Ans. {y:y is a point common to any two parallel lines} is a null set because parallel lines do not intersect. Hence, they have no common point.

HOME WORK:

NCERT BOOK:

EX-1.2: 1(i, ii)

8. Which of the following sets are finite or infinite:

i. The set of positive integers greater than 50.

Ans. The set of positive integers greater than 50 is an infinite set because positive integers greater than 50 are infinite in number.

ii. The set of prime numbers less than 71.

Ans. The set of prime numbers less than 71 is a finite set because prime numbers less than 71 are finite in number.

HOME WORK:

NCERT BOOK:

EX-1.2: 2(i,ii,iii)

9. In the following, state whether A=B or not:

i. A= {2,4,6,8}, B={x:x is even positive integer and $x \leq 8$}

Ans. A={2,4,6,8}

B={x:x is even positive integer and $x \leq 8$} ={2,4,6,8}

Therefore, A=B.

HOME WORK:

NCERT BOOK:

EX-1.2: 4(i,ii)

10. Are the following pair of sets equal? Give reason.

i. A= {2,3}, B={x:x is solution of $x^2+5x+6=0$}

Ans. A={2,3}, B={x:x is solution of $x^2+5x+6=0$}

The equation $x^2+5x+6=0$ can be solved as:

$x(x+3)+2(x+3)=0$

$(x+3)(x+2)=0$

X=-2 or x=-3

Therefore, A={2,3}, B={-2,-3}

Therefore, A≠B

HOME WORK:

NCERT BOOK:

EX-1.2: 5 & 6.