Unit 1 · Set

HARDER PRACTICE QUESTIONS

Full marks 33

Write your answers on separate paper. Give a reason for each answer. Write each member of a set once.

1 Same set or not? [4]

Are the two sets in each pair the same set? Write each by the listing method to find out.

a. $\{x : x \text{ is a factor of } 12\}$ and $\{1, 2, 3, 4, 6, 12\}$

b. The letters of the word *listen* and the letters of the word *silent*

c. {even prime numbers} and {2}

d. $\{x : x \text{ is a multiple of 4 less than } 20\}$ and $\{x : x \text{ is an even number from 2 to 18}\}$

2 Spot the errors [3]

Nischal wrote these three lines. Each has one mistake. Write each line correctly, and say what was wrong.

i. The set of the letters of the word *pepper* is $\{p, e, p, p, e, r\}$.

ii. {factors of 10} = {2, 5}

iii. $O = \{1, 3, 5, 7, 9\}$, so $O \in 7$.

3 From clues to a set [4]

C is the set of the numbers from 1 to 30 that obey **all three** clues:

- the number is a multiple of 3;
- the number is odd;
- the digits of the number add up to 9.

i. Write C by the listing method.

ii. Leave out the clue "the number is odd". Which number joins the set?

iii. One clue can be left out without changing the set at all. Which one? Why?

4 A class timetable [4]

Here is a made-up timetable for Grade 6. Each day has three periods.

Day	Periods
Sunday	Math, Science, Nepali
Monday	English, Math, Social
Tuesday	Science, Nepali, Computer
Wednesday	Math, English, Science
Thursday	Nepali, Social, Health
Friday	Math, Computer, English

S is the set of the days with a Science period, C the set of the days with a Computer period, and M the set of the days with a Math period.

i. Write S and C by the listing method.

ii. Fill in $\in$ or $\notin$: Thursday ___ M; Friday ___ C; Saturday ___ S.

iii. List the days that are in both S and M.

iv. Is "the days with a difficult subject" a set? Why or why not?

5 How many members? [3]

Write each set by the listing method, and say how many members it has.

i. $\{x : x \text{ is a 2-digit number whose digits add up to 5}\}$
ii. $\{x : x \text{ is a multiple of 5 between 101 and 151}\}$
iii. The set of the letters of the word *kakarbhitta*

6 Make the rule exact [4]

Apekshya wrote: "$B = \{\text{big prime numbers less than 20}\} = \{11, 13, 17, 19\}$."

i. Why is her describing method not well defined?
ii. Write B by the describing method so that it is well defined and has exactly the members she listed.
iii. Write B by the set-builder method.
iv. Is 23 a member of your set B? Write it with $\in$ or $\notin$.

7 Two digits in order [4]

$P = \{x : x \text{ is a 2-digit number whose tens digit is bigger than its ones digit}\}$

i. Fill in $\in$ or $\notin$: 31 ___ P; 13 ___ P; 55 ___ P; 90 ___ P.
ii. List the members of P that are less than 40.
iii. Without listing them, how many members of P are in the nineties, 90 to 99?

8 Make your own [3]

i. Show that the set of the letters of *noon* is the same as the set of the letters of *on*.
ii. Write an English word of 5 or more letters whose set of letters has only 3 members. Write the set.
iii. Write two different words that have the same set of letters, other than *noon* and *on* and the words on this sheet.

9 Think: every one is the odd one out [4]

Look at the numbers 3, 8, 9 and 21. Each of them can be the odd one out, for a different reason. For each number, say why it is the odd one out, and name the set of the other three.