Unit 21 · Presentation of Data

HARDER PRACTICE QUESTIONS

Full marks 35

Write your answers on separate paper. Show your working. Draw graphs on graph paper, with a title, named axes, the scale and, for two sets of numbers, a key. Unless a question names its source, the numbers are made up.

1 Spot the errors [4]

Anuska wrote these four. Each one is wrong. Correct it, and say what went wrong.

i. The last cumulative frequency in a table is the biggest frequency.
ii. A double bar graph shows 30 girls and 50 boys in a class, so 30% of the class are girls.
iii. On a line graph, the steepest piece of the line shows the biggest number.
iv. In a multiple bar graph, a group's bars have gaps between them, and the groups touch.

2 Work back from the running total [4]

Prapti made a cumulative frequency table of her class's quiz marks (out of 10), but lost the frequency column.

Marks	5	6	7	8	9	10
Cumulative frequency	2	6	11	19	23	25

i. Copy the table and add a row for the frequency.
ii. How many students took the quiz?
iii. How many students got 8 or more?
iv. Prapti says: "More than half the class got 7 or less." Is she right? Give a reason.

3 The shape before the graph [4]

From the unit's table: each month's average temperature (°C) at Kathmandu's and Pokhara's airports, 1991–2020:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Kathmandu	11.0	13.7	17.4	20.5	22.7	24.4	24.5	24.6	23.7	20.6	16.0	12.2
Pokhara	13.5	16.2	20.1	23.1	24.6	26.0	26.4	26.4	25.5	22.6	18.4	14.7

Answer without drawing the graph.

i. Between which two months does Kathmandu's line graph go up most steeply? By how much?
ii. Between which two months does Kathmandu's line go down most steeply? By how much?
iii. Where is Kathmandu's line almost flat? Where is Pokhara's line exactly flat?
iv. If both lines are drawn on one graph, do they ever cross? In which month are they closest, and how far apart are they then?

4 Judge the graphs [4]

Four students drew graphs. Say what is wrong with each, and how to put it right.

i. Ayushma drew a line graph of her classmates' favorite colors.
ii. Nischal drew a bar graph whose Y-axis has the numbers 0, 10, 20, 40 and 80, one square apart.
iii. Tashi drew a double bar graph of boys and girls in each class, in two colors, but with no key.
iv. Arman drew a line graph of a shop's sales in the years 2078, 2079, 2081 and 2082, one square apart.

5 From tallies to bars [4]

Fifteen students of each section said how they come to school (W on foot, B bus, C bicycle). Section A: W B W C W B B W C W W B W C B. Section B: B B W C B C B W B C B B W B C.

i. Make one table, with tally marks and a frequency for each section.
ii. Show the table in a double bar graph.
iii. For which way to school is the difference between the sections biggest?
iv. Sadikshya says: "More of Section B come by bus, so Section B's students live farther from the school." Does the graph show that? Give a reason.

6 Difference or times? [4]

From the unit's table: the average rain (mm) in the monsoon months at Kathmandu's and Pokhara's airports, 1991–2020:

Month	May	Jun	Jul	Aug	Sep	Oct
Kathmandu	129	241	384	343	208	43
Pokhara	355	648	941	839	635	159

i. In which month is Pokhara's rain the most millimeters more than Kathmandu's? By how much?
ii. In which month is Pokhara's rain the most **times** Kathmandu's? About how many times (to one decimal place)?
iii. By what percentage is Pokhara's rain more than Kathmandu's in that month?
iv. On a double bar graph of this table, which of i and ii can you see at a glance, and which is hard to see? Explain why.

7 Two schools, one graph [4]

The students of two schools in a municipality, year by year:

Year (BS)	2076	2077	2078	2079	2080
School A	120	135	150	160	170
School B	180	175	165	160	150

i. Draw both on one line graph, with a key. Choose a scale that starts above 0 and show the break in the axis.
ii. In which year do the two lines meet? What does that mean?
iii. Between which two years did the gap between the schools shrink the most?
iv. In 2080, which school had more students, and by what percentage more than the other?

8 Think: the same numbers, two pictures [4]

Tomatoes cost Rs. 60, 62, 65, 64 and 70 a kilogram in five weeks. On line graph P the Y-axis starts at 0, 1 square for Rs. 10; on graph Q it starts at 55 with a zigzag, 1 square for Rs. 1.

i. On each graph, how many squares higher is week 5's dot than week 1's?
ii. Did the price rise more on one graph than on the other? By what percentage did it really rise from week 1 to week 5?
iii. A bar graph of the prices starts at 55, with no zigzag. How many times as tall as week 1's bar does week 5's look? How many times week 1's price is it really?
iv. Why may a line graph start above 0 with a zigzag, while a bar graph should start at 0?

9 Make your own [3]

i. Write a set of data for a line graph and one for a multiple bar graph. Say why for each.
ii. Write a frequency table of five rows, with a cumulative frequency column whose last number is 20.
iii. Describe a line graph that rises slowly, stays flat, then falls steeply, and say what it could show.