CHAPTER Eight

Percentages, Cost And Selling Price, Commission And Vat

Percentage is the term used when the total number of living or non living things, under consideration is one hundred.

- For examples if one says that 20% of the animals in my farm are goats, means that out of every one hundred animals chosen or selected from my farm, 20 of them will be goats.

- Also given that 8% of the students who wrote the exams failed, implies that out of very 100 students who wrote the exams, 8 of them did not pass.

Q1. Find 10% of ¢200.

Soln.

$10\% \text{ of } 200 = \frac{10}{100} \times 200 = ¢20.$

Q2. Determine 30% of 800.   .

.   Soln   .

$30\% \text{ of } ¢800 = \frac{30}{100} \times 800 = ¢240.$

Q3.Calculate $10\frac{1}{2}\% \ of \ 400.$

Soln.

$10\frac{1}{2}\% \ of \ 400 = \frac{21}{2}\% \ of \ 400 = \frac{21 \times 400}{2 \times 100} = 42.$

Q4. Calculate $20\frac{2}{4}\% \ of \ 800.$

Soln.

$20\frac{2}{4}\% \ of \ 800 = \frac{82}{4} \ of \ 800 = \frac{82 \times 800}{4 \times 100} = 164.$

$Q5 \ Find \ 2 \ {}^{4}/_{5} \% \ of \ 1500 \ cedis \ given \ by \ a \ father to \ his \ son.$

Soln

Amount given to the son $= 2\frac{4}{5}\% \ of \ ¢1500 = \frac{14}{5}\% \ of \ ¢1500 = \frac{14 \times 1500}{5 \times 100} = ¢42.$

Percentage increase:

- To determine the present number of living or non living things after a percentage increase, the value of the percentage increase is first determined, and then added to the original number of the living or non living things.

Q1. There are 250 students in a school. If this number is increased by 20%, determine the number students who are now in the school.

Soln.

Original number of students = 250.

Percentage increase = 20%. Value of percentage increase = 20% of 250

$= \frac{20}{100} \times 250 = 50$

Number of students who are now in the school = 250 + 50 = 300 students.

Q2. A girl has an amount of ¢400. If this is increased by 40%, how much does she now have?

Soln.

Initial amount = ¢400 and percentage increase = 40%. Value of the percentage

increase $= \frac{40}{100} \times 400 = 160, => increase =$

$¢160. \ Amount \ she \ is \ now \ having = ¢400 + ¢160 = ¢560.$

Q3. The cost price of a pen is ¢500. If this is to be increased by

$2\frac{1}{5}\%, determine \ the \ new \ price \ .$

Soln.

Initial cost of pen = ¢500 and percentage increase = $2\frac{1}{5}\% = \frac{11}{5}\%$.

Value of percentage increase = $\frac{11}{5}\%\ of\ 500 = \frac{11 \times 500}{5 \times 100} = 11, \Longrightarrow$

the increase in cost price = ¢11.

The cost of the pen presently = ¢500 + ¢11 = ¢511.

Q4. Kofi was given an amount of ¢20 to buy a pen costing ¢15. But when he got to the store, he was made aware that the price of the pen has gone up by 80%. Determine the amount which he added to the ¢20, if he bought the pen.

<div align="center">Soln.</div>

Cost of pen = ¢15 and percentage increase in cost = 80%. Value of percentage

increase = $\frac{80}{100} \times 15 = 12, \Longrightarrow$ *cost of pen* after the increase = 15 + 12 = ¢27.

Since Kofi was given ¢20, then he added ¢7, in order to buy the pen.

Percentage decrease:

- To determine the present number of living or non living things after a percentage decrease, the value of the percentage decrease is first determined, and then subtracted from the original number of the living or non living things.

Q1. There are 250 students in a school. If this number is decreased by 10%, how many students are there now in the school?

<div align="center">Soln.</div>

Initial number of students = 250 and percentage decrease = 10%. Valueof the percentages decrease = 10% x 250 = 25, $\Longrightarrow$ *decrease* = 25.

Number of students who are now in the school = 250 − 25 = 225 students.

Q2. The price of a book is ¢80. If this is to be decreased by 10%, determined its new price.

<div align="center">Soln.</div>

Initial cost price = ¢80 and since percentage decrease = 10% , $\Longrightarrow$

$the\ value\ of\ the\ decrease = \frac{10}{100} \times 80 = 8, \Longrightarrow the\ decrease = $ ¢8.

New price of the pen = 80 − 8 = ¢72.

Q3. A farmer had 800 goats. If this number was decreased by 2¼%, how many goats did he have?

<div align="center">Soln.</div>

Initial number of goats = 800 and percentage decrease = 2¼ % = $\frac{9}{4}$%. Value of the percentage decrease =

$\frac{9}{4}$% $\times\ 800 = \frac{9 \times 800}{4 \times 100} = 18, \Longrightarrow the$ decrease = 18 goats. The number of goats left = 800 − 18 = 782 goats.