Unit 5 · Profit and Loss

STUDY NOTES

WHAT THE BLE ASKS

- **CDC's grid:** Arithmetic (Units 2, 3, 4, 5, 6, 7 together): 14 of 50 marks
- **In our 10 model papers:** 1-mark ×9 · 2-mark ×9
- **Model paper, Arithmetic: one 4-mark question** (a pressure cooker marked Rs 3,900)
  - **a. knowledge (1):** the formula for the discount percent, using MP and D
  - **b. understanding (1):** the discount at 7%: Rs 273
  - **c. application (2):** the shop still makes 17% profit: the cost price; SP = 3900 − 273 = 3627, CP = 3627 × 100/117 = Rs 3,100

Key terms

Cost price (CP): what the seller paid.

Marked price (MP): the price the business fixes and tells customers; on the tag.

Discount (D): the amount taken off the marked price.

Selling price (SP): the price after the discount; what the customer pays.

Discount percent $d\%$: the discount as a percent of the MP.

Profit: SP more than CP. **Loss**: SP less than CP.

Mark-up: the amount a shop adds to the CP to get the MP.

MRP: maximum retail price; on the label, all taxes included.

Formulas

$\text{Profit} = \text{SP} - \text{CP}$	SP more than CP **Use:** the profit
$\text{Loss} = \text{CP} - \text{SP}$	CP more than SP **Use:** the loss
$\text{Profit percent} = \frac{\text{Profit}}{\text{CP}} \times 100\%$	percent of the **CP** **Use:** also the loss percent
$\text{SP} = \text{MP} - \text{D}$	D off the tag **Use:** what is paid
$\text{D} = \text{MP} \times \frac{d}{100}$	$d\%$ of the **MP** **Use:** the discount
$\text{Discount percent} = \frac{\text{D}}{\text{MP}} \times 100\%$	D ÷ MP **Use:** the discount percent

Which price is it a percent of?

Percent	Of
"marked 25% above the cost"	the cost price
discount	the marked price
profit or loss	the cost price

A percent as 100 parts

- 10% off: 10 of the 100 parts come off, 90 are left
- **given the MP:** SP = MP × $(100 - d)/100$
- **given the SP:** the MP is the 100 parts, the SP the $100 - d$ parts → MP = SP × $100/(100 - d)$
- Rs 22,080 at 8% off: Rs 22,080 = 92 parts → ÷ 92 × 100; never add 8% to Rs 22,080 (Rs 23,846.40 is wrong)
- **from the SP to the CP:** the CP is the 100 parts, the SP the $100 + p$ parts for a profit of $p\%$
- the same with a bar: the model drawing method

Steps: all three prices

1. the MP (from the CP and the mark-up, or the tag)
2. the discount on the MP → the SP
3. compare SP with CP → profit or loss
4. its percent, of the CP

Cost price unknown: SP from the discount first; then the profit percent leads back to CP

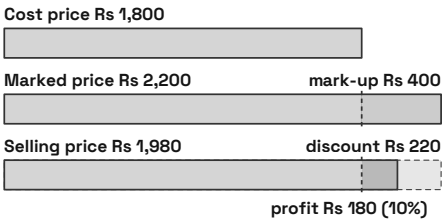
25% up, 25% down

- Rs 36,000 + 25% = Rs 45,000 (+ Rs 9,000)
- Rs 45,000 − 25% = Rs 33,750 (− Rs 11,250): percents of **different** things

- 125/100 × 75/100 = 93.75% of the start: a loss of 6.25% = 25 × 25 ÷ 100

The jacket: is 10% off a loss?

- tag Rs 2,200, 10% off: D = Rs 220, SP = Rs 1,980
- the tag can't say: it depends on the CP



If the shop paid Rs 1,800 (a price made up to show the idea): Rs 400 of mark-up, Rs 220 given back, Rs 180 kept.

- CP Rs 1,800: profit Rs 180 = 10% of the CP
- most it can give: Rs 400 off = 400/2200 × 100% ≈ 18.18%; past that, a loss
- CP Rs 2,000: the same 10% off loses Rs 20
- a discount gives back part of the mark-up; it isn't a 10% loss

Offers and everyday sense

- "Buy 1, get 1 free": Rs 80 for Rs 160 marked = 50%, if you want two
- "Buy 2, get 1 free": Rs 160 for Rs 240 marked = 33⅓%
- sale = stock to turn back into money
  - last sizes
  - out of season
  - old models
- a shop looks at what it makes overall, not on each single thing
- Consumer Protection Act 2075
  - MRP on the label
  - a bill or receipt must be given
  - false or misleading offers are unfair trade
- "50% off" is worth only what the marked price is worth: a raised tag gives nothing away

COMMON MISTAKES

✗ discount percent of the CP or SP
✓ of the **marked price**.

✗ profit or loss percent of the SP
✓ of the **cost price**.

✗ the percent added to the SP to get back to MP or CP
✓ use the parts: ÷ 92 × 100.

✗ 25% up and 25% off called "no change"
✓ percents of different things.

✗ "9%" when the question asks for profit or loss
✓ say which.

Science Playground, Katunje, Bhaktapur
https://science-playground.com/learn/grade-8-math/profit-and-loss