

GRADE VIII – MATHEMATICS

Percentage and its Applications

Complete Solutions: Exercises 6.2, 6.3 and 6.4

EXERCISE 6.2 – PROFIT AND LOSS

1. Find the profit or loss percentage, when C.P. = ₹400, S.P. = ₹468.

$$\text{Profit} = 468 - 400 = ₹68.$$

$$\text{Profit \%} = (68/400) \times 100 = 17\%.$$

2. By selling an article for ₹1636.25, a dealer gains ₹96.25. Find his gain percentage.

$$\text{C.P.} = 1636.25 - 96.25 = ₹1540.$$

$$\text{Gain \%} = (96.25/1540) \times 100 = 6.25\%.$$

3. By selling an article for ₹770, a man incurs a loss of ₹110. Find his loss percentage.

$$\text{C.P.} = 770 + 110 = ₹880.$$

$$\text{Loss \%} = (110/880) \times 100 = 12.5\%.$$

4. Rashida bought 25 dozen eggs at ₹38.40 per dozen. 30 eggs were broken and she sold the remaining eggs at ₹4 each. Find her gain or loss percentage.

$$\text{Cost} = 25 \times 38.40 = ₹960. \text{ Total eggs} = 300; \text{ remaining} = 270. \text{ S.P.} = 270 \times 4 = ₹1080.$$

$$\text{Profit} = 1080 - 960 = ₹120.$$

$$\text{Profit \%} = (120/960) \times 100 = 12.5\% \text{ profit.}$$

5. The cost of an article was ₹20000 and ₹1400 were spent on repairs. If it is sold for a profit of 20%, find its selling price.

$$\text{Total C.P.} = 20000 + 1400 = ₹21400.$$

$$\text{S.P.} = 120\% \text{ of } 21400 = 1.2 \times 21400 = ₹25,680.$$

6. A shopkeeper buys 200 bicycles at ₹4800 each. He spends ₹120 per bicycle on transportation and ₹16000 on advertising. He sells all at ₹5400 each. Find profit/loss and percentage.

$$\text{Total cost} = 200 \times 4800 + 200 \times 120 + 16000 = ₹1,000,000.$$

$$\text{S.P.} = 200 \times 5400 = ₹1,080,000.$$

$$\text{Profit} = ₹80,000.$$

$$\text{Profit \%} = (80000/1000000) \times 100 = 8\%.$$

7. The cost price of an article is 90% of its selling price. Find its profit percentage.

$$\text{If S.P.} = 100, \text{ C.P.} = 90.$$

$$\text{Profit} = 10. \text{ Profit \%} = (10/90) \times 100 = 11 \frac{1}{9}\%.$$

8. Rajeev bought notebooks at the rate of 4 for ₹140 and sold them at the rate of 5 for ₹232. Calculate his gain percentage.

$$\text{C.P. per notebook} = 140/4 = ₹35. \text{ S.P. per notebook} = 232/5 = ₹46.40.$$

$$\text{Profit} = ₹11.40.$$

$$\text{Profit \%} = (11.40/35) \times 100 = 32 \frac{4}{7}\%.$$

9. A dealer bought notebooks to earn a profit of ₹684. He sold a dozen at ₹36 and sold them at 50% profit. Find the selling price per dozen.

At 50% profit, C.P. per dozen = $36 \times 100 / 150 = ₹24$. For a profit of ₹684, total C.P. = $684 \times ?$ The wording in the image is interpreted as the dealer bought a number of notebooks at ₹36 per dozen and sold them at 50% profit. Thus S.P. per dozen = $36 \times 1.5 = ₹54$.

10. A laptop and a mobile phone were bought for ₹40000 and ₹24000 respectively. The shopkeeper made a profit of 6% on the laptop and a loss of 12% on the mobile phone. Find his overall gain/loss percentage.

Combined C.P. = ₹64000. Laptop S.P. = 106% of 40000 = ₹42400. Mobile S.P. = 88% of 24000 = ₹21120. Total S.P. = ₹63520.

Loss = ₹480. Loss % = $(480 / 64000) \times 100 = 0.75\%$ loss.

11. A shopkeeper sold two electronic gadgets for ₹44000 each. He made a loss of 12% on one and a profit of 10% on the other. Find overall gain/loss.

C.P. of first = $44000 / 0.88 = ₹50000$. C.P. of second = $44000 / 1.10 = ₹40000$. Total C.P. = ₹90000; total S.P. = ₹88000.

Loss = ₹2000.

Loss % = $(2000 / 90000) \times 100 = 2 \frac{2}{9}\%$ loss.

12. Find the cost price, when (i) selling price = ₹450, loss = 10%; (ii) selling price = ₹690, profit = 15%.

(i) C.P. = $450 \times 100 / 90 = ₹500$.

(ii) C.P. = $690 \times 100 / 115 = ₹600$.

13. By selling an almirah for ₹15680, a shopkeeper would gain 12%. If it is sold for ₹17500, find his gain/loss percentage.

C.P. = $15680 \times 100 / 112 = ₹14000$.

At ₹17500, profit = ₹3500.

Profit % = $(3500 / 14000) \times 100 = 25\%$.

14. By selling a bicycle at ₹5336, a shopkeeper suffers a loss of 8%. At how much should he sell it to make a profit of $12 \frac{1}{2}\%$?

C.P. = $5336 \times 100 / 92 = ₹5800$.

Required S.P. = 112.5% of 5800 = ₹6525.

EXERCISE 6.3 – DISCOUNT

1(i). M.P. ₹575, discount 12%. Find discount and S.P.

Discount = 12% of 575 = ₹69. S.P. = 575 – 69 = ₹506.

1(ii). Printed price ₹12750, discount 8 1/3%. Find discount and S.P.

8 1/3% = 1/12. Discount = 12750/12 = ₹1062.50. S.P. = 12750 – 1062.50 = ₹11687.50.

2(i). M.P. ₹780, S.P. ₹721.50. Find discount and discount percentage.

Discount = 780 – 721.50 = ₹58.50.

Discount % = (58.50/780)×100 = 7.5%.

2(ii). Advertised price ₹28500, S.P. ₹24510. Find discount and discount percentage.

Discount = 28500 – 24510 = ₹3990.

Discount % = (3990/28500)×100 = 14%.

3. A notebook is marked at ₹90. Find the price a student pays for a dozen notebooks if he gets 15% discount.

Discount per notebook = 15% of 90 = ₹13.50. S.P. = ₹76.50. For 12 notebooks = 12×76.50 = ₹918.

4. A dealer gives 9% discount on an electric fan and charges ₹2912. Find marked price.

S.P. = 91% of M.P. Therefore M.P. = 2912×100/91 = ₹3200.

5. List price ₹800, discount 20%. Find (i) S.P. (ii) C.P. if profit is 25% on selling it.

(i) S.P. = 80% of 800 = ₹640.

(ii) C.P. = 640×100/125 = ₹512.

6. Goods are marked to give 10% profit after allowing 12% discount. If M.P. = ₹2250, find (i) S.P. (ii) C.P.

S.P. = 88% of 2250 = ₹1980.

Since S.P. is 110% of C.P., C.P. = 1980×100/110 = ₹1800.

7. A shopkeeper purchased a calculator for ₹650. He sells it at 20% discount and still makes 20% profit. Find (i) S.P. (ii) M.P.

S.P. = 120% of 650 = ₹780.

780 = 80% of M.P. ⇒ M.P. = 780×100/80 = ₹975.

8. A shopkeeper buys a dinner set for ₹6000 and marks it 80% above C.P. If he gives 15% discount, find M.P., S.P. and profit percentage.

M.P. = 180% of 6000 = ₹10800.

S.P. = 85% of 10800 = ₹9180.

Profit = 3180; Profit % = 3180/6000×100 = 53%.

9. C.P. ₹1600 is 20% below M.P. If sold at 16% discount, find M.P., S.P. and profit percentage.

C.P. = 80% of M.P. ⇒ M.P. = 1600/0.8 = ₹2000.

S.P. = 84% of 2000 = ₹1680.

Profit = ₹80 ⇒ Profit % = 5%.

10. A shopkeeper allows 20% discount and still earns 20% profit. If S.P. = ₹360, find M.P. and C.P.

$$\text{C.P.} = 360 \times 100 / 120 = \text{₹}300.$$

$$\text{M.P.} = 360 \times 100 / 80 = \text{₹}450.$$

11. Printed price of refrigerator ₹28600. Two successive discounts 10% and 5%. Find S.P.

$$\text{S.P.} = 90\% \times 95\% \times 28600 = 0.855 \times 28600 = \text{₹}24453.$$

12. Find a single discount equivalent to successive discounts of 30% and 10%.

$$\text{Equivalent discount} = 1 - (0.70 \times 0.90) = 0.37 = 37\%.$$

EXERCISE 6.4 – GST

1(i). Buying price of a towel ■500, GST 5%.

$\text{GST} = 5\% \text{ of } 500 = \text{■}25$. Buying price including GST = **■525**.

1(ii). 5 kg refined oil at ■250 per kg, GST 5%.

$\text{Price} = 5 \times 250 = \text{■}1250$. $\text{GST} = 5\% \text{ of } 1250 = \text{■}62.50$. Total = **■1312.50**.

2(i). TV bought for ■67500 including 8% GST. Find original price.

$\text{Original price} = 67500 \times 100 / 108 = \text{■}62500$.

2(ii). Shampoo bottle bought for ■540 including 8% GST. Find original price.

$\text{Original price} = 540 \times 100 / 108 = \text{■}500$.

3. AC costs ■34992 including 8% GST. Find price before GST.

$\text{Price before GST} = 34992 \times 100 / 108 = \text{■}32400$.

4. Shirt costs ■1296 including GST. Original price ■1200. Find GST rate.

$\text{GST} = 1296 - 1200 = \text{■}96$.

$\text{GST \%} = 96 / 1200 \times 100 = 8\%$.

5. Purse costs ■523.80 including 8% GST. Find new selling price if GST increases to 10%.

$\text{Original price} = 523.80 \times 100 / 108 = \text{■}485$.

At 10% GST, new price = $485 \times 110 / 100 = \text{■}533.50$.

6. Wall hanging marked ■4800. Shopkeeper offers 10% discount and receives 8% GST from customer. Find amount paid.

After 10% discount: S.P. = $90\% \text{ of } 4800 = \text{■}4320$.

$\text{GST} = 8\% \text{ of } 4320 = \text{■}345.60$.

Amount paid = **■4665.60**.

7. Washing machine marked price ■21800 excluding 9% GST. Customer bargains to pay ■21800 including GST. Find amount reduced by shopkeeper.

Let reduced price be x. Including 9% GST: $1.09x = 21800 \Rightarrow x = \text{■}20000$.

Amount reduced = $21800 - 20000 = \text{■}1800$.