Topic: Transactions in the Homes and Offices (series 1)

Subtopic: Basic Operations

• JSS2 •

Mathematics

Objective

Solve simple commercial arithmetic relating to;

- Profit
- Interest,
- Discount
- Commission.

Profit and loss

The **cost price** is the price that the trader pays when she buys an item.

It also includes any other money she spends on the item before she sells it.

The **selling price** is the price at which the trader sells an item to a customer.

The difference between the cost price and the selling price is the **profit** or **loss**.

If the selling price is more than the cost price, it is a profit.

If the selling price is less than the cost price, it a loss.

Profit or loss Percentage is Unknown

Profit/Loss = Selling price – Cost price

$$\%\text{Profit/Loss} = \frac{Profit/loss}{Cost\ price} \times 100$$

Question 1

A trader buys fifty 1-litre cartons of drinking yoghurt from a factory. He pays ₦550 per one 1-litre carton. On the way to the storeroom, eight cartons burst open and the yoghurt spills out. The trader sells the remaining cartons at ₦600 each. Calculate his percentage profit or loss

Solution

Calculate the total cost price

50 x #550 = #27,500

Calculate the total selling price

Sell only 50 – 8 = 42 cartons

42 x #600 = #25,200

Calculate the profit or loss

Profit/Loss = Selling price – Cost price

Profit/Loss = #25,200 - #27,500

Loss = #2,300

Calculate the Percentage of loss

$$\%\text{Loss} = \frac{loss}{Cost\ price} \times 100$$

$$\text{Loss} = \frac{\#2300}{\#27{,}500} \times 100 = 8.36\%$$

Profit or loss Percentage is Known

$$\text{Cost price} = \text{selling Price} \times \frac{100}{100 + \%profit}$$

$$\text{Cost price} = \text{selling price} \times \frac{100}{100 - \%\,loss}$$

$$\text{Selling price} = \text{cost price} \times \frac{100 + \%profit}{100}$$

$$\text{Selling price} = \text{cost price} \times \frac{100 - \%loss}{100}$$

Question 2

A Seller buys 20 pairs of women's sneakers from a manufacturer. One of the pairs gets damaged as the truck with the shoes is unloaded. The retailer decides to sell this pair at a lowered price of #7,000. The loss is 20%.

Calculate the cost price of this pair of sneakers.

Solution

Cost Price represents 100%

A loss was made on the item, so the

selling price = 100 - %loss = 100 – 20 = 80%

Cost price = selling price x $\frac{\mathbf{100}}{\mathbf{100 - \% \, loss}}$

Cost price = #7000 x $\frac{\mathbf{100}}{\mathbf{80}}$ **=** #8,750

Interest

It is extra money you pay on a loan, or money you earn on an investment.

A **loan** is an amount of money you borrow, that you must normally pay back with interest.

An **investment** is an amount of money you give to a business or bank in the hope of getting more money back.

Simple Interest

= Principal(P) x Interest rate(i) x Time (n)

SI = P x i x n

Actual amounts

A = P + SI

A = P + P x i x n

A = P (1 + in)

Example 3

A man invests ₦60,000 in a fixed deposit account with an interest rate of 8% per annum. Calculate the interest earned over 5 years, as well as the balance of the account at the end of the 5 years.

Solution

A = ? , P = #60,000 , SI = ? , i = 8% , n = 5

SI = P x I x n = 60,000 x 8% x 5

$= 300{,}000 \times \frac{8}{100} = \#24{,}000$

Amount = 60,000 + 24,000

= #84,000

Discount

It is a reduction in the marked price of an item, so that the customer pays less than the normal price for the item. Traders often give a discount when customers **pay cash** instead of buying on credit. They may also give discount when customers buy a **large number** of a specific item.

Discount Percentage is Unknown

Discount = normal price – discounted price

$$\% \text{ discount} = \frac{Discount}{normal\ price} \times 100$$

Question 4

A supermarket has too much stock of a certain brand of breakfast cereal. The manager decides to sell the 350g boxes that are normally priced at ₦1,800 for ₦1,656. Calculate the percentage discount per box.

Discount = normal price – discounted price

= #1,800 - #1,656

=#144

$$\% \text{ discount} = \frac{Discount}{normal\ price} \times 100$$

$$\% \text{ discount} = \frac{\#144}{\#1{,}800} \times 100$$

% discount = 8%

Discount Percentage is Known

Normal price = discounted price x

$$\frac{100}{100 - \%discount}$$

discounted price = normal price x

$$\frac{100 - \%discount}{100}$$

Question 5

A supermarket offers 5% discount if a customer buys more than 20 soft drinks in 33 cl cans. A customer buys 24 cans and pays ₦3,420. Calculate the normal price per can.

Discounted price = 100 – 5 = 95%

Normal price = discounted price x

$$\frac{100}{100 - \%discount}$$

Normal price = #3,420 x $\frac{100}{95}$ = **#3,600**

Commission

It is money that an agent is paid to perform a service. Sales people, insurance agents, debt collectors and lawyers are examples of agents that earn commission for services they provide.

Commission Received, Percentage & Sales

$$\text{Commission received} = \frac{Commission\ percentage\ x\ value}{Services} \text{ x } 100$$

$$\text{Commission Percentage} = \frac{Commission\ received}{value\ of\ sales/services} \text{ x } 100$$

$$\text{Value of Sales/Services} = \frac{Commission\ received}{comission\ percentage}$$

Question 6

A sales person receives a basic salary of ₦85,000 and commission of 15% on all sales above ₦25,000. If this sales person sold stock worth ₦60,000, what is her total pay for the month?

Solution

Commission earned = #60,000 - #25,000 = #35,000

Commission Received = $\frac{15}{100}$ x #35,000 = #5,250

Total Pay = #85,000 + #5,250 = # 90,250

Evaluation

A debt collector receives 12% commission on all money he manages to get in from debtors. Calculate the commission he receives on collections of ₦246,000.

Calculate the total amount of money paid back over 5 years on a loan of ₦25,000 with an interest rate of 15% per annum.

– Thank You –