Name: …… Date ……

GAYAZA HIGH SCHOOL

S.2 MATH WORKSHEET SIX

Percentages, Discounts, Commissions,
Interest, Profit and Loss

PART I

PREREQUISITE KNOWLEDGE:

- PERCENTAGES

The arithmetical principles learned in studying the topic of Percentages can be applied directly in solving problems in Discounts, Commissions, Interest, Profit and Loss.

Discounts, Profit and Loss, Commissions and Interest.
You might have seen while buying goods that on every article/item there is a price marked. This price is known as the market price (M.P.)/original price of the article. In order to clear the stocks or to increase sale, sometimes shopkeepers offer a certain percent of rebate on the marked price for cash payments. This rebate is known as the discount. The customer or buyer pays the difference between the marked price and the discount (selling price (S.P)).

DISCOUNT
Let us see the concept mathematically;

$$\text{S. P} = \text{M. P} - \text{Discount}$$

$$\textbf{Rate of discount} = \textbf{discount in percentage} = \textbf{percentage discount}$$

$$\text{Percentage discount} = \frac{discount}{original\ price(M.P)} \times 100$$

From which: $Discount = \frac{\%\ discount \times M.P}{100}$

$\therefore Discount = M.P\left(\frac{\%\ discount}{100}\right)$

$$\text{Percentage discount} = \frac{original\ price(M.P) - selling\ price}{original\ price(M.P)} \times 100$$

$$\text{Percentage discount} = \frac{M.P - S.P}{M.P} \times 100$$

As we know:

$$\text{S. P} = \text{M. P} - \text{Discount}$$

$$\text{S. P} = \text{M. P} - \frac{\%\ discount \times M.P}{100}$$

$$\text{S. P} = \text{M. P}\left(1 - \frac{\%\ discount}{100}\right)$$

$$\text{S. P} = \text{M. P}\left(\frac{100 - \%\ discount}{100}\right)$$

$\text{M. P} = \text{S. P}\left(\frac{100}{100 - \%\ discount}\right)$ for a discount …… (i)

$\text{C. P} = \text{S. P}\left(\frac{100}{100 + \%\ Gain/profit}\right)$ for a profit made …… (ii)

Also: $M.P = \text{C. P} + \text{Profit}$
$\text{Profit} = \%\ \text{Profit} \times \text{C. P}$
$S.P = \text{C. P}\left(\frac{100 + \%\ Profit}{100}\right)$

C. P $= $ S. P $\left(\frac{100}{100-\%\ Loss}\right)$ for a loss made…… (iii)

Formulas (i), (ii) and (iii) can easily be remembered. A student just needs interpret the question well such she or he can apply the formulas appropriately.

Note: It should be noted that discount is given on the marked price only.

QUESTION AND ANSWER

1.

Question.	What is the way of calculating a discount?
Answer.	In order to calculate a discount, one must multiply the original price (market price) by the decimal form of the percentage: $\boldsymbol{Discount = M.P\left(\frac{\%\ discount}{100}\right)}$ In order to calculate the item's sale price, subtract the discount from the original price (market price)**: S. P $=$ M. P $-$ Discount** .One can do this by using a calculator or mental work.

2.

Question.	How can one take 20% off a price?
Answer.	First of all, one must convert the percentage discount to a decimal. So, a 20 per cent discount happens to be 0.20 in decimal format. Secondly, one must multiply the decimal discount by the item's price to determine the savings

3.

Question.	Explain what is a discount with example?
Answer.	Discount refers to reduced prices or something sold at a price that is lower than the normal price. For example, a purse sold for 50 per cent off its normal price or a store that sells designer items at prices that are below market price.

4.

Question.	Explain how one can calculate a 10% discount?
Answer.	The simple way of calculating 10% discount is to first divide the total sale price by 10. This should be followed by subtraction from the price.

Examples

1. Find the selling price of a toy if the market price (original price) is Shs32000 and discount is 10%.

$$\text{Percentage discount} = \frac{original\ price - selling\ price}{original\ price} \times 100$$

$$10 = \frac{32000 - S.P}{32000} \times 100$$

$$10 = \frac{32000 \times 100 - 100 \times S.P}{32000}$$

$$320000 = 3200000 - 100S.P$$
$$100S.P = 3200000 - 320000$$
$$100S.P = 2880000$$
$$S.P = \frac{2880000}{100}$$
$$S.P = Shs.28800$$

2. Find the market price of a chair, if Moses paid shs.171500 after discount of 2%.

$$\text{Percentage discount} = \frac{original\ price - selling\ price}{original\ price} \times 100$$

$$2 = \frac{original\ price - 171500}{original\ price} \times 100$$

$$2 = \frac{M.P \times 100 - 171500 \times 100}{M.P}$$

$$2M.P = 100\text{M. P} - 17150000$$
$$100M.P - 2M.P = 17150000$$
$$98M.P = 17150000$$
$$M.P = \frac{17150000}{98}$$
$$M.P = Shs.175{,}000$$

3. Mr. Ssali paid shs.28125 for T-shirt in a sale, while the price tag shows M.P = shs.31250. Find the discount in percentage.

$$\text{Percentage discount} = \frac{discount}{original\ price} \times 100$$
$$\text{Percentage discount} = \frac{31250 - 28125}{31250} \times 100$$
$$= \frac{3125}{31250} \times 100$$
$$\text{Percentage discount} = \frac{312500}{31250}$$
$$\text{Percentage discount} = 10\%$$

4. A shopkeeper offers his customers 10% discount and still makes a profit of 26%. What is the actual cost to him of an article marked shs.14000.
Calculation for selling price
We know:

$$\text{M. P} = \text{shs. } 1400$$
$$\%\ \text{discount} = 10$$
$$\text{S. P} = \text{M. P}\left(\frac{100 - \%\ discount}{100}\right)$$
$$\text{S. P} = 14000\left(\frac{100 - 10}{100}\right)$$
$$\text{S. P} = 14000\left(\frac{90}{100}\right)$$
$$\text{S. P} = \text{shs. } 12{,}600$$

Calculation for cost price
We know:

$$\text{S. P} = \text{shs. } 12{,}600$$
$$\text{profit} = 26\%$$

Therefore,

$$\text{C. P} = \text{S. P}\left(\frac{100}{100 + \%\ Gain/profit}\right)$$
$$\text{C. P} = 12600\left(\frac{100}{100 + 26}\right)$$
$$\text{C. P} = 12600\left(\frac{100}{126}\right)$$
$$\text{C. P} = \text{shs. } 10{,}000$$

5. A dealer marks his goods at 35% above the cost price and allows a discount of 20% on the marked price. Find his gain or loss per cent.
Let the CP of the goods be x.
$M.P = \text{C. P} + \text{Profit}$
$\text{Profit} = \%\ \text{Profit} \times \text{C. P}$

$$\text{Profit} = \frac{35}{100}\ of\ x$$

Marked price of the goods $= x + \left(\frac{35}{100}x\right) = shs.1.35\,x$

Discount = 20%

Selling price = MP – Discount

$$Discount = \frac{\%\ discount \times M.P}{100}$$

$$Discount = 20\%\ of\ 1.35x = 1.35x \times 0.2$$
$$= shs.0.27x$$
$$Selling\ price = MP - Discount$$
$$SP = 1.35x - 0.27x$$
$$SP = Shs.1.08x$$

As S.P is more than C.P, there is a profit.

So,

$$Profit = SP - CP$$
$$= 1.08x - x$$
$$= 0.08x$$

$$Profit\ percentage = (\frac{Profit}{C.P})\ x\ 100$$
$$= (\frac{0.08x}{x}) \times 100$$
$$= 8\ \%$$

EXERCISE

1. At a clearance sale, all goods are on sale at 45% discount. If Jacinta buys a skirt marked Shs.30000, how much would I need to pay?

2. After allowing a discount of 12% on the marked price of an article, it is sold for shs.44000. Find the market price.

3. Sarah bought a television set at a discount of 12% and sold it at a profit of 25%. If she sold it at shs. 800,000. What was the original price of the television set?

4. The marked price of a water cooler is Shs. 17,670,000. The shopkeeper offers an off-season discount of 18% on it. Find its selling price.

5. A cell phone was marked at 40% above the cost price and a discount of 30% was given on its marked price. Find the gain or loss percent made by the shopkeeper.

6. The marked price of a television is Shs. 7,300,000. A dealer allows two successive discounts of 20% and 5%. For how much is the television available?

7. Find the rate of discount being given on a shirt whose selling price is shs. 54,600 after deducting a discount of shs. 104,00 on its marked price.

END.