

Percentage Ratio & More

Q1. After purchasing two copies of same book X sold them respectively at 0.8 and 1.4 times their cost price. What was the percentage gain earned or loss incurred by X?

- a. 5% gain   b. 10% gain   c. 5% loss   d. 10% loss ] ✓ Percentage / Ratio

$$\begin{aligned}
 & CP \text{ of 1 copy} = x \\
 & x \text{ or } Ex \\
 & C_1 = 50 \quad S_1 = 50 \times 0.8 = 40 \\
 & C_2 = 50 \quad S_2 = 50 \times 1.4 = 70 \\
 & \text{Base} \quad 100 \quad 10\% \quad 10\% \\
 & \qquad \qquad \qquad 110
 \end{aligned}$$

*Base*

Q2.  $\frac{4}{5}$  is what percent of  $\frac{1}{5}$ ?

- a. 200%   b. 80%   c. 400%   d. 20%

$$\begin{aligned}
 & \checkmark \left[ \begin{array}{l} 50 \text{ is what percent of } 100? \\ 40 \text{ is what percent of } 80? \end{array} \right] \begin{array}{l} 50\% \\ 50\% \end{array} \\
 & \checkmark \left[ \begin{array}{l} 50 \times 100 = 50\% \\ 40 \times 100 = 50\% \end{array} \right] \begin{array}{l} 100 \\ 80 \end{array}
 \end{aligned}$$

$$\begin{aligned}
 & \frac{4}{5} \times 100 \quad \frac{4}{5} \times \frac{5}{1} \times 100 \\
 & \qquad \qquad \qquad 400\%
 \end{aligned}$$

Q3. If CP is 99rs and Profit percentage is  $11\frac{1}{9}\%$ , then find out selling price.?

$$\boxed{110} \Rightarrow \boxed{11\frac{1}{9}\%} \quad \boxed{P = \frac{1}{100}} \quad \checkmark$$

$$CP = 99 \text{ rs}$$

$$99 \times \frac{1}{9} = 11$$

$$\begin{aligned}
 & \Rightarrow \frac{100}{9} \times \frac{1}{100} \\
 & = \left(\frac{1}{9}\right) \checkmark
 \end{aligned}$$

$$\approx 11\frac{1}{9}$$

$$99 + 11 = 110$$

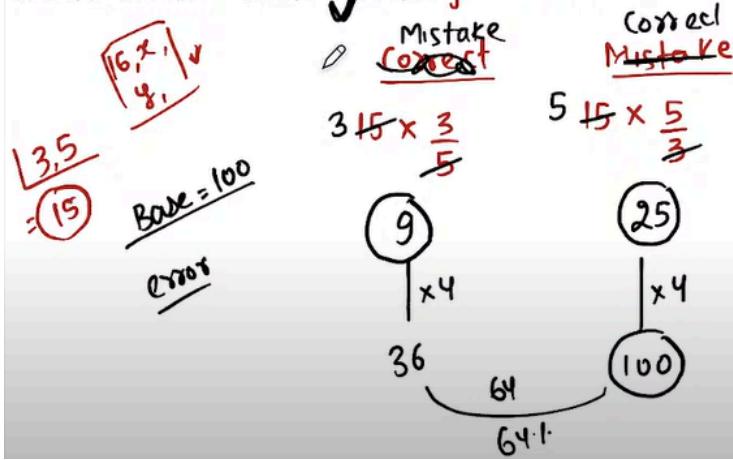
Ratio	Fractional Form	Percentage
1:2	$\frac{1}{2}$	$\left[\frac{1}{2} \times 100\right] \% = 50\%$
1:3	$\frac{1}{3}$	$\left[\frac{1}{3} \times 100\right] \% = 33.33\%$
1:5	$\frac{1}{5}$	$\left[\frac{1}{5} \times 100\right] \% = 20\%$
4:5	$\frac{4}{5}$	$\left[\frac{4}{5} \times 100\right] \% = 80\%$
1:10	$\frac{1}{10}$	$\left[\frac{1}{10} \times 100\right] \% = 10\%$
2:5	$\frac{2}{5}$	$\left[\frac{2}{5} \times 100\right] \% = 40\%$
1:8	$\frac{1}{8}$	$\left[\frac{1}{8} \times 100\right] \% = 12.5\%$
1:50	$\frac{1}{50}$	$\left[\frac{1}{50} \times 100\right] \% = 2\%$
1:100	$\frac{1}{100}$	$\left[\frac{1}{100} \times 100\right] \% = 1\%$

- ✓  $\frac{1}{2} = 50\%$   
 ✓  $\frac{1}{3} = 33.33\%$   
 ✓  $\frac{1}{4} = 25\%$   
 ✓  $\frac{1}{5} = 20\%$   
 ✓  $\frac{1}{6} = 16.67\%$   
 ✓  $\frac{1}{7} = 14.28\%$   
 ✓  $\frac{1}{8} = 12.5\%$   
 ✓  $\frac{1}{9} = 11.11\% = 11\frac{1}{9}\%$

$$\begin{aligned} 1 &= \frac{1}{100} \times 100 \\ 1 &= 100x \\ \frac{1}{2} \times 100 &= 50\% \\ \frac{1}{3} \times 100 &= 33.33\% \end{aligned}$$

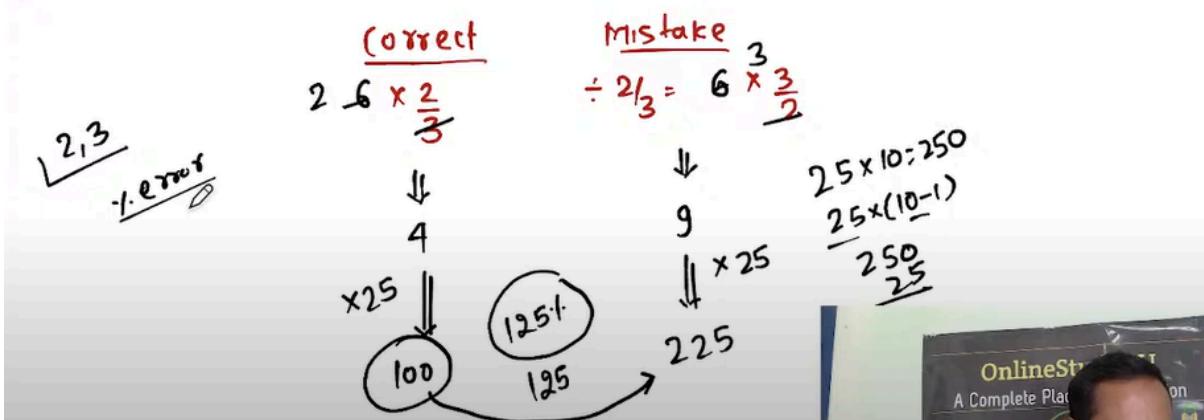
Q5) A student multiplied a number by  $\frac{3}{5}$  instead of  $\frac{5}{3}$ . What is the percentage error in the calculation?

- a. 34% b. 44% c. 54% d. 64% } option are terms in 1.



Q6) A student divided a number by  $\frac{2}{3}$  instead of multiplying  $\frac{2}{3}$ . What is the percentage error in the calculation?

- a. 125% b. 80% c. 25% d. 0%



Q7. A's income is 25% more than Income of B [ Income of B is how much percent less than income of A? ]  
 a. 10% b. 20% c. 40% d. 16 2/3%

$$\begin{array}{c} \frac{A}{125} \quad \frac{B}{100} \\ \Rightarrow \frac{25}{125} \times 100 = 20 \end{array}$$

Q8. If P is 50% more than Q, Q is how much percent less than P?

- a. 50% b. 100% c. 66.66% d. 33.33%

$$\begin{array}{c} \frac{P}{150} \quad \frac{Q}{100} \\ \Rightarrow \frac{50}{150} \times 100 = 33.33\% \\ \text{-----} \end{array} \quad \left| \begin{array}{c} \frac{P}{150} \quad \frac{Q}{100} \\ 3 \quad 2 \\ \frac{1}{3} \times 100 = 33.33\% \end{array} \right.$$

Q9. If income of A is 20% less than B then income of B is how much percent more than A?

- a. 20% b. 25% c. 200% d. 33.33%

$$\begin{array}{c} \frac{A}{80} \quad \frac{B}{100} \\ \frac{20}{80} \times 100 = 25\% \end{array}$$

Q10. If marks of Kejriwal is 33.33% less than Yogi then marks of Yogi is how much ~~per cent~~ more than that of Kejriwal?

- a. 80% b. 120% c. 50% d. 175%

~~X - marks~~ ~~Yogi~~  $\rightarrow$  options are r.

$$33.33\% = \frac{1}{3}$$

<u>Kejriwal</u>	<u>YOGI</u>
4	6

$$\frac{2}{4} \times 100 = 50\%$$

Q11. The price of sugar is increased by 25%. Then by how much percentage the consumption decreases so that expenditure remains same?

- a. 25% b. 20% c. 33% d. 30%

~~X formula~~

$$10\text{rs/kg} \times 20\text{kg} = 200\text{rs}$$

Price  $\times$  Consumption = Expenditure

$$25\% = \frac{25}{100} = \frac{1}{4}$$

$4 \rightarrow 5$ Price	$5\text{kg} \rightarrow 4\text{kg}$ cons
(20) F.D.	(20)

$$\frac{1}{5} \times 100 = 20\%$$

Here  $25\% = \frac{1}{4}$  which mean for 4rs. 1rs is inc that is  $4+1=5$  so  
rs.4--->rs.5 price

As consumption dec from  $\text{price} \times \text{consumption} = \text{expenditure}$ ; p inversely to c so  
 $5 \rightarrow 4$  which mean  $5\text{kg} \rightarrow 4\text{kg}$  cons decrementation

While  $\text{rs. } 4 \times 5\text{kg} = 20\text{exp} \rightarrow \text{rs. } 5 \times 4\text{kg} = 20\text{exp}$  (exp remains const)

Q12. The price of rice is increased by  $16 \frac{2}{3}\%$ . Then by how much percentage the consumption decreases so that expenditure remains same?

- a. 25% b. 20% c. 33% d.  $14 \frac{2}{7}\%$

$$16 \frac{2}{3}\% = \frac{50}{3} \times \frac{1}{100} = \frac{1}{6}$$

$6 \rightarrow 7$ Price	$7 \rightarrow 6$
$(7) - (6)$ cons	$\frac{1}{7} \times 100$
$\text{exp}$	$- 14 \frac{2}{7}\%$

$\Rightarrow 100 \frac{14}{98} \frac{14}{7}$

**Q13**) Length and breadth of a rectangle is increased by 10%. Find the percentage increase in its area.?

- a. 21% Increase
- b. 40% increase
- c. 44% increase
- d. 20% increase

$$\begin{array}{l} \text{Old} \\ \text{New} \\ \begin{array}{l} \text{1st Md} \\ \text{10} \times 10 = \frac{100}{100} = 100 \\ 11 \times 11 = \frac{121}{21} = 21.1 \end{array} \end{array}$$

$$\begin{array}{l} l \\ b \\ \hline A = l \times b \end{array}$$

$$2^{\text{nd}} \text{ Md} = a + b + \frac{ab}{100}$$

$$= (10) + (10) + \frac{(10)(10)}{100}$$

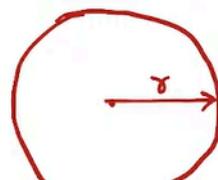
$$20 + 1 = 21.1$$



**Q14**) The radius of a circle is increased by 300 percent. The its area will be increased by what percent.?

- a. 800% Increase
- b. 900% increase
- c. 1500% increase
- d. 1600% increase

$$\begin{array}{l} \text{Old} \\ \text{New} \\ \begin{array}{l} \text{[options]} \\ \text{400\%} \end{array} \end{array}$$



$$A = \pi r^2$$

$$r = 10$$

$$10 \times \frac{300}{100} = 30$$

$$10 + 30 = 40$$

$$\begin{array}{l} A = \pi \times 10 \times 10 - \frac{100\pi}{1500} \\ A = \pi \times 40 \times 40 - \frac{1600\pi}{1500} \end{array}$$

#### Percentage - Zero to Hero

**Q15**) Each side of a square is increased by 17% then its area will be increase by what percentage?

- a. 34% Increase ✗
- b. 36.89% increase
- c. 28.9% increase ✗
- d. 30% increase ✗

$$\begin{array}{l} \square \\ = \\ A = a^2 = a \times a \end{array}$$

$$\begin{array}{l} \rightarrow a + b + \frac{ab}{100} \\ \rightarrow 17 + 17 + \frac{17 \times 17}{100} \\ \rightarrow 34 + \frac{289}{100} \\ \therefore 34 + 2.89 = 36.89 \end{array}$$



Q16. Length, breadth and height of a cuboid is increased by 10%. Find the percentage increase in its volume?

- a. 33.1% Increase
- b. 30 % increase
- c. 46.41% increase
- d. 44% increase

*options*

$$\text{Cuboid (volume)} = l \times b \times h$$

$$V_{\text{old}} = 10 \times 10 \times 10 = \frac{1000}{10} = 100$$

$$V_{\text{new}} = 11 \times 11 \times 11 = \frac{1331}{10} = 133.1$$

$$\frac{33.1}{33.1}$$

(Q17) The price of Iphone 15 pro max is decreased by 10% and again reduced by 10%. Find the combined decrement in total price?

- a. 19%
- b. 21%
- c. 20%
- d. can not be determined

$$10\% = \frac{1}{10}$$

$$10 - 9$$

$$10 - 9$$

$$\begin{array}{r} \times \\ 100 \\ \hline 100 - 81 \\ (19)\cdot 1 \end{array}$$

*Price*

*2nd method*

$$100 \times \frac{(100-10)}{100} \times \frac{(100-10)}{100}$$

$$100 \times \frac{90}{100} \times \frac{90}{100}$$

81

*decrease/loss in %*

(Q18) A worker earns Rs.2800 per week. If his per hour wages is increased by 20% and his working hour is decreased by 25%. Then what will be new wages?

- a. Rs. 2520
- b. Rs. 2500
- c. Rs. 2700
- d. Rs. 2000

*2nd method*

$$20\% = \frac{20}{100} = \frac{1}{5} \quad 25\% = \frac{1}{4}$$

$$\begin{array}{r} \text{1st} \\ \begin{array}{r} 5 - 6 \\ \times 4 - 3 \\ \hline 20 - 18 \end{array} \\ \begin{array}{r} 140 \\ \downarrow \\ 2800 \end{array} \end{array} \quad \boxed{1 \times 140}$$

$$108/\text{hr} \times 20\text{hr} = 2008$$



Q19 Price of rice is reduced by 20%. A Person initially purchase 160kg rice. How much kg of rice he can purchase now in same amount?

- a. 150kg
- b. 180kg
- c. 200kg
- d. None of these

$$20\% = \frac{20}{100} = \frac{1}{5}$$

$$A = 160 \quad I = 40$$

$$5 \times 40 = 200$$

Price  
cons  
Exp

$$= \frac{160}{4} \times 5$$
  
$$= 40 \times 5 = 200$$

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Q20 Price of sugar is increased by 20%. A person initially purchase 60kg pulse. How much kg of sugar he can purchase now in same amount?

- a. 32kg
- b. 40kg
- c. 48kg
- d. 50kg

$$\frac{20}{100} = \frac{1}{5}$$

Price  
cons  
Exp

$$6 \times 5 = 30$$

$$60 \times 5 = 300$$

Q21 when the price of sugar decreases by 10%, a man could buy 1 kg more for Rs.270. then the original price of sugar per kg is?

- a. 28
- b. 30
- c. 32
- d. 26

$$10\% = \frac{10}{100} = \frac{1}{10}$$

difficult

Pizza  
100 - 1 pizza  
50% - 2 pizza

Price  
cons  
Exp

9kg  
1kg  
10kg

$$270 \times \frac{10}{10} = 270$$

$$270 - 270 = 0$$

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Q22 If the price of Rice is decreased by 20%, a person can buy 2kg more rice for Rs.360. Find the original and present price of rice per kg?

- a. 45, 36
- b. 40, 32
- c. 30, 24
- d. 60, 48

$$20\% = \frac{20}{100} = \frac{1}{5}$$

5 — 4 Price

4kg — 5kg cons  
8kg — 1kg 10kg  
1 unit = 2kg (Exp)

$$\frac{360}{8} = 45$$

$$\frac{360}{10} = 36$$

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Q23 A shopkeeper has certain length of wire. [10% of wire is stolen] and [70% of the remaining was sold out]. Find the original length of the wire if 810 meter is still left out.?

- a. 1000
- b. 2000
- c. 1500
- d. 3000

Length = 100

$$100 \times \frac{90}{100} = 90$$

$$90 \times \frac{30}{100} = 810 = \frac{810 \times 100}{27}$$

Left  
 $27 = 810 = 3,000$

$$1 - \frac{810}{27}$$

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10% stolen so there 90%(90/100) on 100 i.e.,  $100 \times (90/100) = 90$

70% sold so there 30%(70/100) on 90 i.e.,  $90 \times (30/100) = 27$  units

So 27 units  $\rightarrow$  given left out for 810metre

1 units  $\rightarrow$  ? on original length  $100 = (810/27 \times 100) = 3000$

Q24. In a library 20% of the books are in Hindi, 50% of the remaining in English and 30% of the remaining are in French and rest 6300 books are in the regional language. The find the no of books in library.

- a. 16,000
- ~~b. 22,500~~
- c. 10,200
- d. 14,400

$$\text{Total No} = 100$$

$$100 \times \frac{20}{100} = 20 \text{ (Hindi)}$$

$$80 \rightarrow 40 \text{ (English)}$$

$$40 \times \frac{30}{100} = 12 \text{ (French)}$$

$$40 - 12 = 28$$

$$\begin{array}{r} 28 \\ \times 6300 \\ \hline 184 \\ 184 \\ \hline 22500 \end{array}$$

Q25. When a student scored 45% marks then he is failed by 24 marks. But when he score 55% marks then he is passed by 36 marks. Find the passing marks and total marks. 7

- a. 249, 450
- b. 294, 400
- ~~c. 294, 600~~
- d. None of these

$$\Rightarrow \left[ \frac{\text{Pass}}{45\% + 24} \right] = \frac{\text{Pass}}{55\% - 36}$$

$$100\% = 60$$

$$100\% = 61$$

$$100\% = 600$$

$$\begin{array}{r} 45\% + 24 \\ \times 6 \\ \hline 270 + 24 \\ \hline 294 \end{array}$$

(Q26) A sales representative's commission is 6% on all sales upto Rs.15000 and 5% on all sales exceeding this. He remits Rs.47350 to his company after deducting his commission. What were the total sales?

- A. Rs.49000 B. Rs.47500 C. Rs.50500 D. Rs.50000

15000 |  $(15000+x)$   
6% | 5%  
---  
50,000 |  $35000 \times 5\%$   
15000 6% | 1750  
= 900
 $900 + 1750 = 2650$

**TCS Commission**  
option attack  
3-4 min  
 $\frac{35000 \times 5}{100}$   
 $= 5000 - 2650$   
 $= 47350$

**Last Question**  
**Loves Support**

Q28. A shopkeeper makes a profit of 12.5% after allowing a discount of 10% on the marked price of the article. Find his profit percentage if the article is sold at the marked price, allowing no discount?

- A. 25% B. 30% C. 22.5% D. 27%

$$\text{Profit} = 12.5\% = \frac{12.5}{100} = \frac{1}{8}$$

$$\begin{matrix} CP \\ 80 \end{matrix} \xrightarrow{\hspace{1cm}} \begin{matrix} SP \\ 90 \end{matrix}$$

$$\text{Discount} = 10\% = \frac{10}{100} = \frac{1}{10}$$

$$\begin{matrix} MP \\ 100 \end{matrix} \xrightarrow{\hspace{1cm}} \begin{matrix} SP \\ 90 \end{matrix}$$

$$\begin{matrix} 100 \\ 80 \\ 100-80 \end{matrix} \xrightarrow{\hspace{1cm}} \text{discount}$$

$$CP : SP : MP = 8 : 9 : 10$$

$$\downarrow \qquad \downarrow$$

$$8 \qquad 10$$

$$\begin{aligned} \text{Profit percentage} &= \frac{10-8}{8} \times 100\% = \frac{2}{8} \times 100 = 25\% \\ \Downarrow &= 25\%. \end{aligned}$$

(10%)

