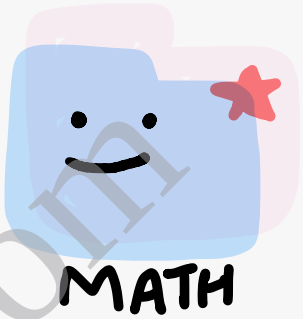
Comparing Quantities
Ex. 7.1



Exc. 7.1

1. D 7 : 25

$28\% = \frac{28}{100} = \frac{28 \div 4}{100 \div 4} = \frac{7}{25} = 7:25$

2. C $\frac{9}{20}$

$45\% = \frac{45}{100} = \frac{45 \div 5}{100 \div 5} = \frac{9}{20}$

3. A 0.12

$12\% = \frac{12}{100} = 0.12$

4. B 273%

$2.73 \times 100 = 273$

5. C 120

25% of $x = 30$

or $\frac{\cancel{25}^{1}}{\cancel{100}_{4}} \times x = 30$

or $\frac{x}{4} = 30$

or $x = 30 \times 4$

or $x = 120$

6. Let total number of matches played be x
No. of matches won = 7
Percentage of matches won = 35%
∴ According to the question

35% of $x = 7$

or $\frac{35}{100} \times x = 7$

or $x = \frac{\cancel{7} \times \cancel{100}^{20}}{\cancel{35}_{1}}$

or $x = 20$

∴ Number of matches played = 20

7. Total number of plants = 2000

Number of rose plants = 10% of 2000

$= \frac{10}{100} \times 2000$

$= 200$

Number of mango plants = 2% of 2000

$= \frac{2}{100} \times 2000$

$= 40$

Number of neem plants = 3% of 2000

$= \frac{3}{100} \times 2000$

$= 60$

Total number of other plants

$= 2000 - (200 + 40 + 60)$

$= 2000 - 300$

$= 1700$

Alternate method

Total number of plants = 2000

Percentage of rose plants = 10

Percentage of mango plants = 2

Percentage of neem plants = 3

Percentage of other plants

$= 100 - (10+2+3)$

$= 100 - 15$

$= 85$

$\therefore$ Total number of other plants

$= 85\%$ of 2000

$= \frac{85}{100} \times 2000$

$= 1700$

8. Let price of computer six months back $= ₹ x$

Decrease in price $= 12\%$ of $₹ x$

$= ₹ \frac{12}{100} x$

Reduced price $= x - \frac{12}{100} x$

$= \frac{100x - 12x}{100}$

$= ₹ \frac{88x}{100}$

Reduced price $= ₹ 39600$

According to the question

$\frac{88x}{100} = 39600$

or $x = \frac{39600 \times 100}{88}$ (3600 → 450)

or $x = 45000$

∴ Price of computer six months back
= ₹ 45000

Alternate method

Let price of computer six months back = ₹ 100

Decrease in price = 12% of ₹ 100
= ₹ 12

Reduced price = 100 − 12
= ₹ 88

If the reduced price is ₹ 88, price six months back = ₹ 100

If the reduced price is ₹ 1, price six months back = ₹ $\frac{100}{88}$

If the reduced price is ₹ 39600, price six months back = $\frac{100}{\cancel{88}_{\cancel{8}1}} \times \cancel{39600}^{\cancel{3600}}450$

= ₹ 45000

∴ Price of computer six months back
= ₹ 45000

9. Let total monthly income = ₹ x

Amount spent on house rent = 20% of ₹ x
= ₹ $\frac{20x}{100}$

Amount spent on household expenditure
= 60% of ₹ x
= ₹ $\frac{60x}{100}$

$$\text{Saving} = x - \left(\frac{20x}{100} + \frac{60x}{100}\right)$$

$$= x - \frac{80x}{100}$$

$$= \frac{100x - 80x}{100}$$

$$= \frac{\overset{1}{\cancel{20}}x}{\underset{5}{\cancel{100}}}$$

$$= ₹\ \frac{x}{5}$$

Saving = ₹ 2000

∴ According to the question

$$\frac{x}{5} = 2000$$

or $x = 2000 \times 5$

or $x = 10000$

∴ Monthly income = ₹ 10000

Alternate method

Let monthly income be ₹ 100

Amount spent on house rent = 20% of ₹100

= ₹ 20

Amount spent on household expenditure

= 60% of ₹ 100

= ₹ 60

Saving = 100 − (20 + 60)

= 100 − 80

= ₹ 20

If the saving is ₹20, monthly income = ₹100

If the saving is ₹1, monthly income = ₹ $\frac{100}{20}$

= ₹ 5

If the saving is ₹ 2000, monthly income

$= 2000 \times 5$

$= ₹ 10000$

$\therefore$ Monthly income $= ₹ 10000$

10. Let price of pulses $= ₹ 100$

Increase in price $= 30\%$ of ₹ 100

$= ₹ 30$

Increased price $= 100 + 30$

$= ₹ 130$

Let original consumption of pulses $= 100$ kg

For ₹ 130, pulses consumed $= 100$ kg

For ₹ 1, pulses consumed $= \frac{100}{130}$ kg

For ₹ 100, pulses consumed $= \frac{100}{130} \times 100$

$= \frac{1000}{13}$ kg

$\therefore$ Reduction in consumption $= 100 - \frac{1000}{13}$

$= \frac{1300 - 1000}{13}$

$= \frac{300}{13}$ kg

Percentage reduction in consumption

$= \frac{\frac{300}{13}}{\frac{100}{1}} \times \frac{1}{100}$

$= \frac{300}{13}\% \simeq 23.08\%$

11. Let income of Harish = ₹100

∴ Income of Ravi = 100 − 20% of 100

= 100 − 20

= ₹80

Difference in income = 100 − 80

= ₹20

Percentage by which Harish's income is more than that of Ravi $= \frac{20^{1}}{\cancel{80}\times 1} \times \cancel{100}^{25}$

= 25%

12. Let total number of votes be x.

Percentage of votes winning candidate got = 53

Number of votes opponent got = 31% of x

$= \frac{31x}{100}$

∴ According to the question

$\frac{31x}{100} = 31000$

1000

or $x = \frac{\cancel{31000}\times 100}{\cancel{31}\ 1}$

or $x = 100000$

∴ Total number of votes = 100000

Number of votes winning candidate got = 53% of 100000

$= \frac{53}{\cancel{100}} \times 1000\cancel{00}$

= 53000

$\therefore$ Winning margin $= 53000 - 31000$
$= 22000$

$\therefore$ Total number of votes $= 100000$

Winning margin $= 22000$

13. Let the population a year ago $= x$

Increase in population $= 6\%$ of x

$= \frac{6x}{100}$

Present population $= x + \frac{6x}{100}$

Present population $= 15900$ (given)

$\therefore$ According to the question

$x + \frac{6x}{100} = 15900$

or $\frac{100x + 6x}{100} = 15900$

or $\frac{106x}{100} = 15900$

or $x = \frac{15900 \times 100}{106}$ (150 and 106 cancel; 1)

or $x = 15000$

$\therefore$ Population a year ago $= 15000$

Alternate method

Let the population a year ago $= 100$

Increase in population $= 6\%$ of 100

$= 6$

$\therefore$ Present population $= 100 + 6$

$= 106$

Present population = 15900 (given)

If the present population is 106, population a year ago = 100

If the present population is 1, population a year ago = $\frac{100}{106}$

If the present population is 15900, population a year ago = $\frac{100}{\cancel{106}_{1}} \times \overset{150}{\cancel{15900}}$

$= 15000$

$\therefore$ Population a year ago $= 15000$

14. Let number of passengers in the train before station A $= x$

Number of passengers who got down at station A = 30% of x

$= \frac{30x}{100}$

Remaining passengers $= x - \frac{30x}{100}$

$= \frac{100x - 30x}{100}$

$= \frac{70x}{100}$

Number of passengers who got down at station B = 50% of $\frac{70x}{100}$

$= \frac{50}{100} \times \frac{70}{100} x = \frac{35x}{100}$

Remaining passengers $= \frac{70x}{100} - \frac{35x}{100}$

$= \frac{35x}{100}$

Remaining passengers = 350 (given)

∴ According to the question

$\frac{35x}{100} = 350$

or $x = \frac{\overset{10}{\cancel{350}} \times 100}{\underset{1}{\cancel{35}}}$

or $x = 1000$

∴ Number of passengers in the train before station A = 1000

<u>Alternate method</u>

Let number of passengers in the train before station A = 100

Number of passengers who got down at station A = 30% of 100

= 30

Remaining passengers = 100 − 30

= 70

Number of passengers who got down at station B = 50% of 70

$= \frac{\cancel{50}^{1}}{\cancel{100}} \times \cancel{70}^{35}$

$= 35$

Remaining passengers = 70 − 35

= 35

Remaining passengers = 350 (given)

If the remaining passengers are 35, number of passengers before station A $= 100$

If the remaining passenger is 1, number of passengers before station A $= \frac{100}{35}$

If the remaining passengers are 350, number of passengers before station A

$$= \frac{100}{\cancel{35}_{1}} \times \cancel{350}^{10}$$

$$= 1000$$

$\therefore$ Number of passengers in the train before station A = 1000

15. People liking cricket = 60·1·
People liking football = 30·1·
People liking other games $= [100 - (60 + 30)]$·1·

$$= (100 - 90)\cdot 1\cdot$$

$$= 10\cdot 1\cdot$$

Total number of people in city = 50,00,000
No. of people liking cricket $= \frac{60}{1\cancel{00}} \times 5000\cancel{00}$

$$= 30,00,000$$

No. of people liking football $= \frac{30}{1\cancel{00}} \times 5000\cancel{00}$

$$= 15,00,000$$

No. of people liking other games $= \frac{10}{1\cancel{00}} \times 5000\cancel{00}$

$$= 5,00,000$$