

COMPARING QUANTITIES

Exercise 8.1

1. To Compare two Quantities, the units must be the same.
2. **RATIO**: It is written as $a:b$
Ratio has no units.
3. **SIMPLEST FORM**: If HCF of a and b is 1, then the ratio $(a:b)$ is in the simplest form.
4. **EQUIVALENT RATIO**:
Step (i) Write the given ratios in the form of fraction.
Step (ii) Convert fractions into like fractions.
If the resulting fractions are Equal then the given ratios are Equivalent.

For Example: $1:3$ and $2:9$

Step (i) Fraction of $1:3 = \frac{1}{3}$

Fraction of $2:9 = \frac{2}{9}$

Step (ii) change them into Like fractions

$$\frac{1}{3} = \frac{1}{3} \times \frac{3}{3} = \frac{3}{9}$$

$$\frac{2}{9} = \frac{2}{9} \times \frac{1}{1} = \frac{2}{9}$$

$\therefore 1:3$ and $2:9$ are not Equivalent.

1. Find the ratio of

(i) ₹ 5 to 50 Paise.

$$\text{Sol. Ratio} = \frac{5 \text{ Rs.}}{50 \text{ Paise}} = \frac{5 \times 100 \text{ Paise}}{50 \text{ Paise}} = \frac{500}{50} = \frac{10}{1} = 10:1 \text{ Ans.}$$

(ii) 15 kg to 210 g

$$\text{Sol. Ratio} = \frac{15 \text{ kg}}{210 \text{ g}} = \frac{15 \times 1000 \text{ g}}{210 \text{ g}} = \frac{15000}{210} = \frac{500}{7} = 500:7 \text{ Ans.}$$

(iii) 4 m to 400 cm

$$\text{Sol. Ratio} = \frac{4 \text{ m}}{400 \text{ cm}} = \frac{4 \times 100 \text{ cm}}{400 \text{ cm}} = \frac{400}{400} = \frac{1}{1} = 1:1 \text{ Ans.}$$

(iv) 30 days to 36 Hours.

$$\text{Sol. Ratio} = \frac{30 \text{ days}}{36 \text{ hours}} = \frac{30 \times 24 \text{ hours}}{36 \text{ hours}} = \frac{720}{36} = \frac{20}{1} = 20:1 \text{ Ans.}$$

2. Are the ratios 1:2 and 2:3 Equivalent?

$$\text{Sol. Fraction part of } 1:2 = \frac{1}{2}$$

$$\text{Fraction part of } 2:3 = \frac{2}{3}$$

Change them into Like fractions

$$\frac{1}{2} = \frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$$

$$\therefore \frac{3}{6} < \frac{4}{6}$$

$$\frac{2}{3} = \frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$$

$\therefore$ 1:2 and 2:3 are not Equivalent.

3. If the cost of 6 toys is 240 Rs. Find the cost of 21 toys.

Sol: Let x be the cost of 21 toys.

No. of toys	6	21
Cost	240	x

$\therefore$ More toys $\rightarrow$ More Cost

$\therefore$ It is a case of direct Proportion

$$6 : 240 :: 21 : x$$

$$\frac{\overset{1}{\cancel{6}}}{\underset{40}{240}} = \frac{21}{x}$$

$$\frac{1}{40} = \frac{21}{x}$$

$$x = 40 \times 21$$

$$x = 840 \text{ Rs.}$$

$\therefore$ Cost of 21 toys = 840 Rs.

4. The Car that I own can go 150 km with 25 litres of Petrol. How far can it go with 30 litres of Petrol.

Sol: Let the distance covered by a car with 30 litres of petrol be x .

distance (in km)	150 km	x
Petrol (in litre)	25	30

$\therefore$ More Petrol $\rightarrow$ More distance

$\therefore$ It is a case of direct Proportion

$$\therefore \frac{150}{25} = \frac{x}{30}$$

$$x = \frac{150 \times 30}{25}$$

$$x = 180 \text{ km.}$$

Distance Covered by Car in 30 litres = 180 km.

4. In a Computer lab, there are 3 Computers for every 6 students. How many Computers will be needed for 24 students?

Sol $\Rightarrow$ Let x Computers will be needed for 24 students

No. of Computers	3	x
No. of students	6	24.

$\therefore$ more students $\rightarrow$ more Computers

$\therefore$ It is a case of direct Proportion

$$\frac{3}{6} = \frac{x}{24}$$

$$x = \frac{3 \times 24}{6} = 12 \text{ Computers Ans.}$$