Proportion

- When two ratios are equal, they are said to be in proportion.
- It is written as a : b = c : d or $\frac{a}{b} = \frac{c}{d}$.
- In proportion, the product of the extremes = product of the means.
- That means a × d = b × c.

Important Terms

• In a : b = c : d,

a and d are called extremes

b and c are called means

How to check proportion

- Step 1: Write both ratios in fraction form
- Step 2: Cross multiply and compare
- If both products are equal, the ratios are in proportion

Examples with Solutions

Example

Are 2, 4, 5, and 10 in proportion?

- Form ratios: $\frac{2}{4}$ and $\frac{5}{10}$
- Simplify: $\frac{2}{4} = \frac{1}{2}, \frac{5}{10} = \frac{1}{2}$

Yes, they are in proportion

Example

Check if 6:9 and 10:15 are in proportion

- Write as fractions: $\frac{6}{9}$ and $\frac{10}{15}$
- Cross multiply: 6 × 15 = 90,
- 9 × 10 = 90

Yes, they are in proportion

Example

Are 3, 7, 6, and 14 in proportion?

- Check: 3 × 14 = 42,
- 7 × 6 = 42

Yes, they are in proportion

Example

Are 8: 10 and 12: 16 in proportion?

- Cross multiply: 8 × 16 = 128,
- 10 × 12 = 120

No, they are not in proportion

Example

Find the missing number: 4: x = 6:9

- Cross multiply: $4 \times 9 = x \times 6$
- 36 = 6x

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$$x = \frac{36}{6} = 6$$

x = 6

Summary Points

- Proportion means equality of two ratios.
- a : b = c : d is a proportion if a × d = b × c.
- Use cross multiplication to check proportion.
- In proportion, a and d are extremes, b and c are means.
- Missing terms in proportion can be found by solving equations.