

# GRADE: 7

---

## LESSON: Ratio and Proportions

### DETAILED ANSWERS

#### SECTION A ( $4 \times 10 = 40$ marks)

---

##### 1. Choose the correct option:

a) The ratio of 10 to 50:

- Ratio =  $\frac{10}{50} = 1 : 5$
- **Correct Answer:** (i) 1:5

b) The simplest form of 18:24:

- GCD of 18 and 24 is 6.
- $\frac{18}{6} : \frac{24}{6} = 3 : 4$
- **Correct Answer:** (i) 3:4

c) Finding A:C:

- Given A:B = 3:5 and B:C = 4:7
- $A : C = 3 \times 4 : 5 \times 7 = 12 : 35$
- **Correct Answer:** (i) 12:35 d) Type of proportion:
- 8:16 and 4:8 are equivalent ratios.
- **Correct Answer:** (ii) Equivalent ratio

##### 2. Solve the following:

a) Ratio of 150 cm to 2 meters:

- 2 meters = 200 cm

- Ratio =  $\frac{150}{200} = 3 : 4$

b) Convert to ratios:

- 25 min to 45 sec:
  - 25 min = 1500 sec
  - Ratio =  $\frac{1500}{45} = 100 : 3$
- 3 kg to 500 g:
  - 3 kg = 3000 g
  - Ratio =  $\frac{3000}{500} = 6 : 1$

c) Find x in proportion:

- $\frac{9}{x} = \frac{3}{5}$
- Cross multiply:  $9 \times 5 = 3x$
- $x = 15$

### 3. Solve the following equations:

a) Number of girls in school:

- Ratio of boys to girls = 5:6
- Total parts =  $5+6 = 11$
- Number of girls =  $\frac{6}{11} \times 210 = 114$

b) Fourth proportional:

- $\frac{7}{21} = \frac{9}{x}$
- Cross multiply:  $7x = 21 \times 9$
- $x = 27$

c) Worker's savings and expenses:

- Savings = Earnings - Expenses =  $1200 - 900 = 300$
- Savings to earnings =  $300:1200 = 1:4$
- Expenses to earnings =  $900:1200 = 3:4$

### 4. TRUE or FALSE:

a) False (3:5 is not equal to 5:3)

b) **True**

c) **False** (Number of students and salary cannot be compared as a ratio)

d) **False** (Sum of numbers in 4:5 is 9, which is not always a multiple of 9)

## 5. Solve the following problems:

a) Share of ₹5,400 among three children in 4:5:7:

- Total parts =  $4+5+7 = 16$
- Share of each:
  - $\frac{4}{16} \times 5400 = ₹1350$
  - $\frac{5}{16} \times 5400 = ₹1687.50$
  - $\frac{7}{16} \times 5400 = ₹2362.50$

b) Number of balls:

- Total balls = 54, ratio = 3:2:4
- Total parts =  $3+2+4 = 9$
- Number of each:
  - Red:  $\frac{3}{9} \times 54 = 18$
  - Blue:  $\frac{2}{9} \times 54 = 12$
  - Green:  $\frac{4}{9} \times 54 = 24$

c) Cost of 7 pens:

- Cost per pen =  $\frac{360}{12} = 30$
- Cost of 7 pens =  $7 \times 30 = ₹210$

## SECTION B ( $4 \times 10 = 40$ marks)

---

### 6. Graph-Based Question:

- Graph drawn separately
- Ratio of students in A to B =  $25:30 = 5:6$

### 7. Ratio and Proportion Calculations:

a) ₹780 divided in 2:3:5:

- Total parts =  $2+3+5 = 10$
- Shares:
  - $\frac{2}{10} \times 780 = ₹156$
  - $\frac{3}{10} \times 780 = ₹234$
  - $\frac{5}{10} \times 780 = ₹390$

b) Distance walked in 5 hours:

- Distance per hour =  $7 \div 2 = 3.5$  km
- Distance in 5 hours = **17.5 km**

c) Weight of heavier object:

- $\frac{4}{3} \times 18 = 24kg$

## 8. Real-Life Application Problems:

a) Ingredients:

- First ingredient =  $\frac{2}{3} \times 300 = 200g$
- Third ingredient =  $\frac{5}{3} \times 300 = 500g$

b) Distance traveled by train:

- Distance = Speed  $\times$  Time = **360 km**

c) Rope length:

- Total = 150 m, Ratio = 3:2
- First part = **90 m**, Second part = **60 m**

## 9. Compound Ratios & Proportions:

a) Ages in 5:6:7 ratio, sum = 108:

- Total parts = 18
- Ages: **30, 36, 42 years**

b) Population of towns in 3:5:

- Total parts = 8
- Town 1: **12,000**, Town 2: **20,000**

c) Total amount if largest share is ₹2800 in 2:5:7:

- 7 parts = 2800, 1 part = 400
- Total amount = **₹5600**

## 10. HOTS:

a) Father's age equation:

- $4S + 6 = 5(S + 6)$
- Solving: Son = **6 years**, Father = **24 years**

b) Find numbers:

- $\frac{7x+4}{9x+4} = \frac{5}{6}$
- Solving: **28, 36**

c) Distance traveled by second cyclist:

- $\frac{4}{3} \times 24 = 32km$

**END OF SOLUTIONS**