

NCERT Exemplar Class 6 Maths Solutions
Chapter 8: Ratio and Proportion**Multiple Choice Questions (1-10)**

Choose the correct option for each question.

1. The ratio of 8 books to 20 books is:

- (A) 2 : 5
- (B) 5 : 2
- (C) 4 : 5
- (D) 5 : 4

Solution: (A) 2 : 5

The comparison of two numbers or quantities by division is known as the ratio. The symbol ':' is used to denote ratio.

Ratio of 8 books to 20 books = $8/20$

Dividing both numerator and denominator by 4: = $2/5$

Therefore, ratio of 8 books to 20 books = 2 : 5

2. The ratio of the number of sides of a square to the number of edges of a cube is:

- (A) 1 : 2
- (B) 3 : 2
- (C) 4 : 1
- (D) 1 : 3

Solution: (D) 1 : 3

We know that:

- Number of sides in a square = 4
- Number of edges in a cube = 12

Ratio of sides to edges = $4/12$

Dividing both numerator and denominator by 4: = $1/3$

Therefore, ratio of sides to edges = 1 : 3

3. A picture is 60cm wide and 1.8m long. The ratio of its width to its perimeter in lowest form is:

- (A) 1 : 2
- (B) 1 : 3
- (C) 1 : 4
- (D) 1 : 8

Solution: (D) 1 : 8

Given:

- Width of picture = 60 cm
- Length of picture = 1.8 m = 180 cm (since 1 m = 100 cm)

Perimeter of rectangle = $2(\text{length} + \text{width}) = 2(180 + 60) = 2(240) = 480$ cm

Ratio of width to perimeter = $60/480$

Dividing both numerator and denominator by 20: = $3/24$

Dividing again by 3: = $1/8$

Therefore, the ratio = 1 : 8

4. Neelam's annual income is Rs. 288000. Her annual savings amount to Rs. 36000. The ratio of her savings to her expenditure is:

- (A) 1 : 8
- (B) 1 : 7

(C) 1 : 6

(D) 1 : 5

Solution: (B) 1 : 7

Given:

- Annual income = Rs. 288000
- Annual savings = Rs. 36000

Expenditure = Income - Savings = 288000 - 36000 = Rs. 252000

Ratio of savings to expenditure = $36000/252000 = 36/252$

Dividing by 12: = $3/21$

Dividing by 3: = $1/7$

Therefore, ratio = 1 : 7

5. Mathematics textbook for Class VI has 320 pages. The chapter 'symmetry' runs from page 261 to page 272. The ratio of the number of pages of this chapter to the total number of pages of the book is:

(A) 11 : 320

(B) 3 : 40

(C) 3 : 80

(D) 272 : 320

Solution: (C) 3 : 80

Given:

- Total pages = 320
- Symmetry chapter runs from page 261 to 272

Number of pages in symmetry chapter = $272 - 261 + 1 = 12$

Ratio = $12/320$

Dividing by 2: = $6/160$

Dividing by 2 again: = $3/80$

Therefore, ratio = 3 : 80

6. In a box, the ratio of red marbles to blue marbles is 7:4. Which of the following could be the total number of marbles in the box?

(A) 18

(B) 19

(C) 21

(D) 22

Solution: (D) 22

Given ratio = 7:4

Let the common factor be x. Then red marbles = 7x and blue marbles = 4x

Total marbles = $7x + 4x = 11x$

The total number must be a multiple of 11.

Checking options:

- $18 \div 11 =$ not a whole number
- $19 \div 11 =$ not a whole number
- $21 \div 11 =$ not a whole number
- $22 \div 11 = 2 \checkmark$

Therefore, 22 is the answer.

7. On a shelf, books with green cover and brown cover are in the ratio 2:3. If there are 18 books with green cover, then the number of books with brown cover is:

- (A) 12
 (B) 24
 (C) 27
 (D) 36

Solution: (C) 27

Given:

- Ratio of green to brown books = 2:3
- Green books = 18

Let common factor = x Then $2x = 18$ $x = 9$

Brown books = $3x = 3 \times 9 = 27$

8. The greatest ratio among the ratios 2:3, 5:8, 75:121 and 40:25 is:

- (A) 2 : 3
 (B) 5 : 8
 (C) 75 : 121
 (D) 40 : 25

Solution: (D) 40 : 25

Converting to decimal form:

- $2:3 = 2/3 = 0.67$
- $5:8 = 5/8 = 0.625$
- $75:121 = 75/121 = 0.62$
- $40:25 = 40/25 = 1.6$

The greatest value is 1.6, so 40:25 is the greatest ratio.

9. There are 'b' boys and 'g' girls in a class. The ratio of the number of boys to the total number of students in the class is:

- (A) $b/(b + g)$
 (B) $g/(b + g)$
 (C) b/g
 (D) $(b + g)/b$

Solution: (A) $b/(b + g)$

Total students = $b + g$

Ratio of boys to total students = $b/(b + g)$

10. If a bus travels 160 km in 4 hours and a train travels 320km in 5 hours at uniform speeds, then the ratio of the distances travelled by them in one hour is:

- (A) 1 : 2
 (B) 4 : 5
 (C) 5 : 8
 (D) 8 : 5

Solution: (C) 5 : 8

Distance travelled per hour:

- Bus: $160/4 = 40$ km/h
- Train: $320/5 = 64$ km/h

Ratio = $40:64 = 40/64$

Dividing by 8: = $5/8$

Therefore, ratio = 5 : 8

Fill in the Blanks - Proportions (11-15)

11. $3/5 = []/20$

Solution: Let the missing number be y . $3/5 = y/20$

Cross multiplying: $y = (3 \times 20)/5 = 60/5 = 12$

Therefore, $3/5 = [12]/20$

12. $[]/18 = 2/9$

Solution: Let the missing number be y . $y/18 = 2/9$

Cross multiplying: $y = (2 \times 18)/9 = 36/9 = 4$

Therefore, $[4]/18 = 2/9$

13. $8/[] = 3.2/4$

Solution: Let the missing number be y . $8/y = 3.2/4$

Cross multiplying: $y = (8 \times 4)/3.2 = 32/3.2 = 320/32 = 10$

Therefore, $8/[10] = 3.2/4$

14. $[]/45 = 16/40 = 24/[]$

Solution: For the first blank: Let P be the missing number. $P/45 = 16/40$

Cross multiplying: $P = (16 \times 45)/40 = 720/40 = 18$

For the second blank: Let Q be the missing number. $16/40 = 24/Q$

Cross multiplying: $Q = (24 \times 40)/16 = 960/16 = 60$

Therefore, $[18]/45 = 16/40 = 24/[60]$

15. $16/36 = []/63 = 36/[] = []/117$

Solution: First blank: $16/36 = P/63$ $P = (16 \times 63)/36 = 1008/36 = 28$

Second blank: $28/63 = 36/Q$ $Q = (36 \times 63)/28 = 2268/28 = 81$

Third blank: $36/81 = R/117$ $R = (36 \times 117)/81 = 4212/81 = 52$

Therefore, $16/36 = [28]/63 = 36/[81] = [52]/117$

True or False Questions (16-34)

16. $3/8 = 15/40$

Solution: True

$15/40 = 3/8$ (dividing by 5)

17. $4 : 7 = 20 : 35$

Solution: True

$20/35 = 4/7$ (dividing by 5)

18. $0.2 : 5 = 2 : 0.5$

Solution: False

$0.2/5 = 0.04$ $2/0.5 = 4$ $0.04 \neq 4$

19. $3 : 33 = 33 : 333$

Solution: False

$3/33 = 0.0909$ $33/333 = 0.099$ $0.0909 \neq 0.099$

20. $15m : 40m = 35m : 65m$

Solution: False

$15/40 = 3/8$ (dividing by 5) $35/65 = 7/13$ (dividing by 5) $3/8 \neq 7/13$

21. $27\text{cm}^2 : 57\text{cm}^2 = 18\text{cm} : 38\text{cm}$

Solution: True

$$27/57 = 9/19 \text{ (dividing by 3)} \quad 18/38 = 9/19 \text{ (dividing by 2)} \quad 9/19 = 9/19 \quad \checkmark$$

22. $5\text{kg} : 7.5\text{kg} = \text{Rs } 7.50 : \text{Rs } 5$

Solution: False

$$5/7.5 = 2/3 \quad 7.50/5 = 3/2 \quad 2/3 \neq 3/2$$

23. $20\text{g} : 100\text{g} = 1\text{metre} : 500\text{cm}$

Solution: True

$$\text{Since } 1 \text{ metre} = 100 \text{ cm: } 20/100 = 1/5 \quad 100/500 = 1/5 \quad 1/5 = 1/5 \quad \checkmark$$

24. $12 \text{ hours} : 30 \text{ hours} = 8\text{km} : 20\text{km}$

Solution: True

$$12/30 = 2/5 \text{ (dividing by 6)} \quad 8/20 = 2/5 \text{ (dividing by 4)} \quad 2/5 = 2/5 \quad \checkmark$$

25. The ratio of 10kg to 100kg is 1:10

Solution: True

$$10/100 = 1/10 = 1:10 \quad \checkmark$$

26. The ratio of 150cm to 1metre is 1:1.5

Solution: False

$$\text{Since } 1 \text{ metre} = 100 \text{ cm: } 150/100 = 3/2 = 3:2 \text{ Not } 1:1.5$$

27. $25\text{kg} : 20\text{g} = 50\text{kg} : 40\text{g}$

Solution: True

Converting to same units (grams): $25\text{kg} = 25000\text{g}$, $50\text{kg} = 50000\text{g}$

$$25000/20 = 1250 \quad 50000/40 = 1250 \quad 1250 = 1250 \quad \checkmark$$

28. The ratio of 1 hour to one day is 1:1

Solution: False

$$\text{Since } 1 \text{ day} = 24 \text{ hours: } 1/24 \neq 1/1$$

29. The ratio 4:16 is in its lowest form

Solution: False

$$4/16 = 1/4 \text{ (dividing by 4)} \text{ So lowest form is } 1:4$$

30. The ratio 5:4 is different from the ratio 4:5

Solution: True

$$5/4 = 1.25 \quad 4/5 = 0.8 \quad 1.25 \neq 0.8 \quad \checkmark$$

31. A ratio will always be more than 1

Solution: False

A ratio can be less than, equal to, or greater than 1.

32. A ratio can be equal to 1

Solution: True

$$\text{Example: } 2:2 = 2/2 = 1$$

33. If $b : a = c : d$, then a, b, c, d are in proportion

Solution: False

For a proportion, we need $a : b = c : d$ (not $b : a = c : d$)

34. The two terms of a ratio can be in two different units

Solution: False

For a ratio, both quantities must be in the same unit.

Fill in the Blanks (35-46)

35. A ratio is a form of comparison by _____.

Solution: division

36. $20m : 70m = Rs\ 8 : Rs$ _____.

Solution: 28

$$20/70 = 8/P \quad P = (70 \times 8)/20 = 28$$

37. There is a number in the box [] such that [], 24, 9, 12 are in proportion. The number in the box is _____.

Solution: 18

Let P be the missing number. $P : 24 = 9 : 12$ $P/24 = 9/12 = 3/4$ $P = (3 \times 24)/4 = 18$

38. If two ratios are equal, then they are in _____.



Solution: proportion

39. The ratio of the perimeter of the boundary of the shaded portion to the perimeter of the whole figure is _____.

Solution: 3:7

From the given figure:

- Perimeter of shaded portion = $1 + 2 + 1 + 2 = 6$ units
- Perimeter of whole figure = $3 + 4 + 3 + 4 = 14$ units
- Ratio = $6/14 = 3/7 = 3:7$

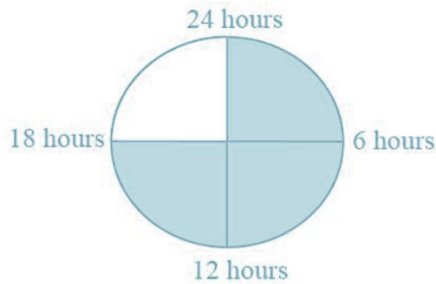
40. The ratio of the area of the shaded portion to that of the whole figure is _____.

Solution: 1:6

From the figure:

- Area of shaded portion = $2 \times 1 = 2$ sq. units
- Area of whole figure = $3 \times 4 = 12$ sq. units
- Ratio = $2/12 = 1/6 = 1:6$

41. The ratio of sleeping time to awaking time is _____.



Solution: 3:1

From the figure:

- Sleeping time = 18 hours
- Awaking time = $24 - 18 = 6$ hours
- Ratio = $18/6 = 3/1 = 3:1$

42. A ratio expressed in lowest form has no common factor other than _____ in its terms.

Solution: one

43. To find the ratio of two quantities, they must be expressed in _____ units.

Solution: same

44. Ratio of 5 paise to 25 paise is the same as the ratio of 20 paise to _____

Solution: 100 paise

$$5/25 = 20/Q \quad Q = (20 \times 25)/5 = 100$$

45. Saturn and Jupiter take 9 hours 56 minutes and 10 hours 40 minutes, respectively for one spin on their axes. The ratio of the time taken by Saturn and Jupiter in lowest form is _____.

Solution: 149:160

Converting to minutes:

- Saturn: $9 \times 60 + 56 = 596$ minutes
- Jupiter: $10 \times 60 + 40 = 640$ minutes

$$\text{Ratio} = 596/640 = 149/160 \text{ (dividing by 4)}$$

Key Concepts Covered

1. **Ratio Definition:** Comparison of two quantities by division
2. **Ratio Properties:** Must be in same units, can be simplified
3. **Proportion:** When two ratios are equal
4. **Cross Multiplication:** Method to solve proportions
5. **Unit Conversion:** Essential for comparing different units
6. **Simplification:** Reducing ratios to lowest terms

This completes the comprehensive solution set for NCERT Exemplar Class 6 Mathematics Chapter 8: Ratio and Proportion.