

Algebra, Ratio and Proportion

Mathematics · Class 6 · Topic-wise Practice Worksheet

TIME 45 minutes	QUESTIONS 18	TOTAL MARKS 24	MAX. SCORE ___ / 24
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Name: _____ Class/Sec: _____ Date: _____

INSTRUCTIONS

- There are **18 questions** in this worksheet. All questions are compulsory.
- Each question has four options (A), (B), (C) and (D). Exactly **one** option is correct.
- Questions 1–15 carry **1 mark** each. Questions 16–18 (Achievers Section) carry **3 marks** each.
- There is no negative marking. Use of a calculator is **not** allowed.
- Rough work may be done in the space at the side of each page.

Section A — Mathematical Reasoning

Q1–Q8 · 1 mark each

- If $x = 7$, the value of $3x - 5$ is _____.
 (A) 16 (B) 21
 (C) 26 (D) 12
- The solution of the equation $4y + 9 = 29$ is $y =$ _____.
 (A) 4 (B) 5
 (C) 9 (D) 20
- 'Five less than twice a number n ' is written as _____.
 (A) $2n + 5$ (B) $5n - 2$
 (C) $5 - 2n$ (D) $2n - 5$
- The ratio $20 : 35$ in its simplest form is _____.
 (A) $4 : 7$ (B) $2 : 3$
 (C) $5 : 7$ (D) $20 : 35$
- If $4 : 9 = 12 : x$, then $x =$ _____.
 (A) 17 (B) 24
 (C) 27 (D) 36
- The perimeter of a square of side s is written as _____.
 (A) $s + 4$ (B) s^2
 (C) $2s$ (D) $4s$
- Which of these is an **equation**?
 (A) $3x + 7 = 22$ (B) $3x - 7$
 (C) $3x + 7$ (D) $3x$
- Two quantities are in the ratio $3 : 5$ and their sum is 64. The smaller quantity is _____.
 (A) 18 (B) 24
 (C) 32 (D) 40

9. The cost of 7 identical books is ₹441. What is the cost of 11 such books?
 (A) ₹630 (B) ₹714
 (C) ₹693 (D) ₹770
10. The ages of a father and son are in the ratio 7 : 2. If the son is 12 years old, how old is the father?
 (A) 36 years (B) 54 years
 (C) 48 years (D) 42 years
11. If a pencil costs ₹p and a pen costs ₹3 more than a pencil, the total cost of one pencil and one pen is _____.
 (A) $2p + 3$ (B) $p + 3$
 (C) $3p$ (D) $2p - 3$
12. The table shows a pattern of matchsticks used to build squares in a row. How many matchsticks are needed for n squares?

Number of squares	1	2	3	4
Matchsticks	4	7	10	13

Table 12.1

- (A) $4n$ (B) $3n + 1$
 (C) $n + 3$ (D) $4n - 1$
13. Solve: $\frac{x}{3} + 4 = 10$
 (A) $x = 2$ (B) $x = 14$
 (C) $x = 18$ (D) $x = 42$
14. ₹1,200 is shared between two friends in the ratio 5 : 7. How much does the one with the larger share get?
 (A) ₹500 (B) ₹600
 (C) ₹840 (D) ₹700
15. A car travels 180 km in 3 hours. In how many hours will it travel 300 km at the same speed?
 (A) 5 hours (B) 4 hours
 (C) 6 hours (D) 8 hours

Achievers Section

Q16–Q18 · 3 marks each

16. Consider the following statements.
 (i) A ratio has no units.
 (ii) The ratio 2 : 3 is the same as the ratio 3 : 2.
 (iii) An equation stays true if the same number is added to both sides.
 Which of the statements is/are correct?
 (A) (i) and (ii) only (B) (i) and (iii) only
 (C) (ii) and (iii) only (D) All three
17. The present ages of Anu and Bina are in the ratio 4 : 5. After 6 years the ratio will be 6 : 7. What is Anu's present age?
 (A) 16 years (B) 12 years
 (C) 20 years (D) 24 years

18. The sum of three consecutive even numbers is 84. What is the largest of them?

(A) 26

(B) 28

(C) 30

(D) 32

Answer Key

1	A	2	B	3	D	4	A	5	C
6	D	7	A	8	B	9	C	10	D
11	A	12	B	13	C	14	D	15	A
16	B	17	B	18	C				

Solutions

1. Answer: (A) 16

Substitute $x = 7$.

$$3x - 5 = 3 \times 7 - 5 = 21 - 5 = \mathbf{16}.$$

2. Answer: (B) 5

$$4y + 9 = 29$$

$$4y = 29 - 9 = 20$$

$$y = 20 \div 4 = \mathbf{5}.$$

$$\text{Check: } 4(5) + 9 = 29. \checkmark$$

3. Answer: (D) $2n - 5$

Twice the number is $2n$, and five less than that means subtracting 5, giving $\mathbf{2n - 5}$.

4. Answer: (A) 4 : 7

The HCF of 20 and 35 is 5.

$$20 \div 5 = 4 \text{ and } 35 \div 5 = 7, \text{ so the ratio is } \mathbf{4 : 7}.$$

5. Answer: (C) 27

In a proportion, the product of the extremes equals the product of the means.

$$4 \times x = 9 \times 12$$

$$4x = 108, \text{ so } x = \mathbf{27}.$$

6. Answer: (D) $4s$

A square has four equal sides, so the perimeter is $s + s + s + s = \mathbf{4s}$. (s^2 would be its area.)

7. Answer: (A) $3x + 7 = 22$

An equation must contain an equals sign, showing that two expressions are equal. Only $\mathbf{3x + 7 = 22}$ does. The others are expressions, not equations.

8. Answer: (B) 24

$$\text{Total parts} = 3 + 5 = 8, \text{ so } 1 \text{ part} = 64 \div 8 = 8.$$

$$\text{The smaller quantity is 3 parts} = 3 \times 8 = \mathbf{24}. \text{ (The larger is } 5 \times 8 = 40, \text{ and } 24 + 40 = 64. \checkmark)$$

9. Answer: (C) ₹693

$$\text{Cost of 1 book} = 441 \div 7 = ₹63.$$

$$\text{Cost of 11 books} = 11 \times 63 = \mathbf{₹693}.$$

10. Answer: (D) 42 years

$$2 \text{ parts correspond to 12 years, so } 1 \text{ part} = 6 \text{ years.}$$

$$\text{Father's age} = 7 \text{ parts} = 7 \times 6 = \mathbf{42 \text{ years}}.$$

11. Answer: (A) $2p + 3$

$$\text{Cost of the pen} = p + 3.$$

$$\text{Total} = p + (p + 3) = \mathbf{2p + 3}.$$

12. Answer: (B) $3n + 1$

Each extra square adds 3 matchsticks because one side is shared.

Testing $3n + 1$: for $n = 1$ it gives 4 ✓, for $n = 2$ it gives 7 ✓, for $n = 3$ it gives 10 ✓, for $n = 4$ it gives 13 ✓.

So the rule is $\mathbf{3n + 1}$.

13. Answer: (C) $x = 18$

$$\frac{x}{3} + 4 = 10$$

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

$$x = 6 \times 3 = \mathbf{18}.$$

$$\text{Check: } 18 \div 3 + 4 = 6 + 4 = 10. \checkmark$$

14. Answer: (D) ₹700

Total parts = $5 + 7 = 12$, so 1 part = $1,200 \div 12 = ₹100$.

The larger share is 7 parts = $7 \times 100 = ₹700$.

15. Answer: (A) 5 hours

Speed = $180 \div 3 = 60$ km/h.

Time for 300 km = $300 \div 60 = 5$ hours.

16. Answer: (B) (i) and (iii) only

Statement (i) is true — a ratio compares two like quantities, so the units cancel. Statement (ii) is false; order matters, and $2 : 3$ is not the same as $3 : 2$. Statement (iii) is true; this is the balancing rule used to solve equations. Hence **(i) and (iii)**.

17. Answer: (B) 12 years

Let their ages be $4x$ and $5x$.

After 6 years: $\frac{4x + 6}{5x + 6} = \frac{6}{7}$

Cross-multiplying: $7(4x + 6) = 6(5x + 6)$

$28x + 42 = 30x + 36$

$6 = 2x$, so $x = 3$.

Anu's age = $4x = 12$ years.

Check: ages are 12 and 15; after 6 years, 18 and 21, which is $6 : 7$. ✓

18. Answer: (C) 30

Let the numbers be x , $x + 2$ and $x + 4$.

$x + (x + 2) + (x + 4) = 84$

$3x + 6 = 84$

$3x = 78$, so $x = 26$.

The numbers are 26, 28 and 30, so the largest is **30**.

Check: $26 + 28 + 30 = 84$. ✓