

STD 7 MATHS Model Paper 1

Answer Key

Activity 1: Ratio and Proportion

(a) Complete the table:

Height (cm)	Width (cm)	Ratio
5	10	1:2
6	4	3:2
4	12	1:3

(b)

- Girls to boys ratio = 3:2
- If girls = 120, boys = $\frac{120 \times 2}{3} = 80$.
- Total number of students = $120 + 80 = 200$.

Activity 2: Algebra

(a)

(i) $5x + 10$

(ii) $2x - 4$

(b)

(i) $(12 + 8) - 5 = 20 - 5 = 15$

(ii) $(20 - 6.5) + 3.5 = 13.5 + 3.5 = 17$

Activity 3: Geometry

(a)

(i) $\text{Area} = \frac{1}{2} \times 6 \times 4 = 12 \text{ cm}^2$

(ii) $\text{Area} = \frac{1}{2} \times 8 \times 5 = 20 \text{ cm}^2$

(b)

- Perimeter = 20 cm, Ratio of length to breadth = 3:2.
- Let the dimensions be $3x$ and $2x$.

$$2(3x + 2x) = 20 \implies 10x = 20 \implies x = 2$$

Length = $3 \times 2 = 6 \text{ cm}$, Breadth = $2 \times 2 = 4 \text{ cm}$.

- Area = $6 \times 4 = 24 \text{ cm}^2$.

Activity 4: Powers and Exponents

(a)

(i) $8 \times 8 \times 8 = 8^3$

(ii) $2 \times 2 \times 2 \times 2 = 2^4$

(b)

(i) $512 \div 64 = 8$

(ii) $3^2 \times 3^3 = 3^{2+3} = 3^5$.

Activity 5: Factors

(a)

(i) Prime factorization of $56 = 2^3 \times 7$.

(ii) Prime factorization of $72 = 2^3 \times 3^2$.

(b)

(i) HCF of 24 and 36 = 12

(ii) HCF of 48 and 60 = 12

Activity 6: Practical Applications of Ratio

(a)

- Ratio of rice to black gram = 4:1.
- If rice = 16 cups, black gram = $\frac{16}{4} = 4$ cups.

(b)

- Ratio of workers to machines = 5:3.
- If workers = 15, machines = $\frac{15 \times 3}{5} = 9$.

Activity 7: Problem Solving

(a)

- Perimeter = 36 cm, Ratio of length to breadth = 5:4.
- Let the dimensions be $5x$ and $4x$.

$$2(5x + 4x) = 36 \implies 18x = 36 \implies x = 2$$

Length = $5 \times 2 = 10$ cm, Breadth = $4 \times 2 = 8$ cm.

- Area = $10 \times 8 = 80$ cm².

(b)

- Total length = 25 m, Ratio = 2:3.
- Let the parts be $2x$ and $3x$.

$$2x + 3x = 25 \implies 5x = 25 \implies x = 5$$

Lengths are $2 \times 5 = 10$ m and $3 \times 5 = 15$ m.