CLASS VIII – MATHEMATICS

Chapter Test: Area – Step-by-Step Solutions & Marking Scheme

(Ganita Prakash, Grade 8, Part II – Chapter 7)

M. M.: 40 | Marks for each step are shown in square brackets.

Section A – Multiple Choice Questions (1 mark each)

Q.	Ans.	Solution
1	(B)	Area of rectangle = 15 × 8 = 120 cm^2; each triangle is half: **60 cm^2**.
2	(D)	½ × 14 × 9 = **63 cm^2**.
3	(A)	A median divides a triangle into two triangles of equal area: 48 ÷ 2 = **24 cm^2**.
4	(C)	Same base and the same height (distance between the parallel lines) give **equal areas**.
5	(A)	12 × 7.5 = **90 cm^2**.
6	(C)	½ × 18 × 24 = **216 cm^2**.
7	(B)	½ × 6 × (9 + 15) = 3 × 24 = **72 cm^2**.
8	(D)	10 × 6.4516 = **64.516**.
9	(C)	Area of ΔABC = ½ × BC × AX = ½ × 14 × 12 = 84 cm^2. Also ½ × AC × BY = 84, so 15 × BY = 168 and BY = **11.2 cm**.
10	(B)	Area = DC × AX = 15 × 6 = 90 cm^2. Taking AD as the base: 10 × h = 90, so h = **9 cm**.

Section B – Very Short Answer Questions (2 marks each)

Q11. Rhombus (Fig. 3)

(i) Area = ½ × d_1 × d_2 = ½ × 12 × 16 = **96 cm^2**. [1]

(ii) The diagonals bisect each other at right angles, so a side is the hypotenuse of a right triangle with legs 6 cm and 8 cm: side = √(36 + 64) = √100 = **10 cm**. [1]

Q12.

(A) ½ × base × height = 108, so ½ × 18 × h = 108, i.e. 9h = 108. [1] h = **12 cm**. [1]

(B) ½ × h × (8 + 12) = 90, i.e. 10h = 90. [1] h = **9 cm**. [1]

Q13.

(i) 7.62 ÷ 2.54 = **3 in**. [1]

(ii) 129.032 ÷ 6.4516 = **20 in^2**. (Check: 20 × 6.4516 = 129.032.) [1]

Section C – Short Answer Questions (3 marks each)

Q14. Trapezium (Fig. 4)

(i) Area = ½ × h × (sum of parallel sides) = ½ × 8 × (20 + 32) = 4 × 52 = **208 m^2**. [1]

(ii) Cost = 208 × 45 = **₹9360**. [1]

(iii) For an isosceles trapezium, each slant side cuts off (32 − 20)/2 = 6 m along SR. Slant side = √(6^2 + 8^2) = √100 = **10 m**. [1]

Q15.

(A) AD is a median of ΔABC, so it divides it into two triangles of equal area: area(ΔABD) = 64 ÷ 2 = 32 cm^2. [1]

In ΔABD, BE joins vertex B to the midpoint E of the opposite side AD, so BE is a median of ΔABD. [1]

So area(ΔABE) = 32 ÷ 2 = **16 cm^2**. [1]

(B) Area of ΔPBC = ½ × 12 × 7 = **42 cm^2**. [1]

Area of ΔQBC = ½ × 12 × 7 = **42 cm^2**. [1]

Every such triangle has the same base and the same height, so area of ΔRBC = **42 cm²** for any R on the line. [1]

Q16.

(A) Area of rectangle = 20 × 12 = **240 cm²**. [1]

The diagonals bisect each other, so the four triangles have equal bases and the same height, hence equal areas. [1]

Area of each triangle = 240 ÷ 4 = **60 cm²**. [1]

(B) Area = base × height = 16 × 9 = **144 cm²**. [1]

Any side and its corresponding height give the same area, so 12 × h = 144. [1]

h = **12 cm**. [1]

Q17.

(A) Area of the full rectangle = 14 × 10 = 140 m². [1]

Area of the removed corner = 6 × 4 = 24 m². Area of the hall = 140 − 24 = **116 m²**. [1]

Cost = 116 × 80 = **₹9280**. [1]

(B) Area of trapezium = ½ × 8 × (10 + 22) = 4 × 32 = **128 cm²**. [1]

Other side of the rectangle = 128 ÷ 16 = **8 cm**. [1]

Perimeter = 2 × (16 + 8) = **48 cm**. [1]

Section D – Long Answer / Case-based Questions (4 marks each)

Q18.

(A) (i) Area(ΔABD) = ½ × BD × AP = ½ × 26 × 7 = **91 cm²**. [1]

(ii) Area(ΔBCD) = ½ × BD × CQ = ½ × 26 × 9 = **117 cm²**. [1]

(iii) Area(ABCD) = 91 + 117 = **208 cm²**. [1]

(iv) Other side = 208 ÷ 26 = **8 cm**. [1]

(B) (i) Outer rectangle = (28 + 4) × (20 + 4) = 32 × 24 = 768 m². [1] Park = 28 × 20 = 560 m². Path = 768 − 560 = **208 m²**. [1]

(ii) Cost = 208 × 150 = **₹31 200**. [1]

(iii) Perimeter of the outer boundary = 2 × (32 + 24) = **112 m**. [1]

Q19.

(A) (i) Area = 20 × 15 = **300 in²**. [1]

(ii) Area = 300 × 6.4516 [1] = **1935.48 cm²**. [1]

(iii) Length = 20 × 2.54 = **50.8 cm**; width = 15 × 2.54 = **38.1 cm**. (Check: 50.8 × 38.1 = 1935.48.) [1]

(B) (i) Area = ½ × 60 × 80 = **2400 cm²**. [1]

(ii) Half-diagonals are 30 cm and 40 cm: side = √(900 + 1600) = √2500 = **50 cm**. [1]

(iii) A rhombus is a parallelogram: side × height = area, so 50 × h = 2400 [1] and h = **48 cm**. [1]

Q20. Case Study: Lawn and flower bed

(i) Area of lawn = 24 × 18 = **432 m²**. [1]

(ii) The diagonals of the rhombus join midpoints of opposite sides, so they are equal to the sides of the lawn: **24 m and 18 m**. Area = ½ × 24 × 18 = **216 m²**. [1]

(iii) Area covered with grass = 432 − 216 = **216 m²**. [1]

(iv) Cost = 216 × 35 = **₹7560**. [1]

Note for teachers: Award full marks for any correct alternative method. Units must be stated in the final answers.