

## Practice Questions On Area Of Trapezium

Name: \_\_\_\_\_ Date: \_\_\_\_\_

---

### Area of Trapezium Worksheet Questions

#### Fill in the Blanks

Q1: Area of trapezium =  $(1/2) \times (\text{_____} + \text{_____}) \times \text{height}$

Answer: parallel sides (a + b)

Q2: a = 14 cm, b = 10 cm, h = 5 cm  $\rightarrow$  Area = \_\_\_\_\_  $\text{cm}^2$

Answer: 60  $\text{cm}^2$

Q3: Area = 72  $\text{m}^2$ , a + b = 18 m  $\rightarrow$  height = \_\_\_\_\_ m

Answer: 8 m

Q4: Height is always \_\_\_\_\_ to the parallel sides.

Answer: perpendicular

Q5: a = 20 cm, b = 10 cm, h = 6 cm  $\rightarrow$  Area = \_\_\_\_\_  $\text{cm}^2$

Answer: 90  $\text{cm}^2$

Q6: If area = 88  $\text{cm}^2$ , h = 8 cm, a = 9 cm  $\rightarrow$  b = \_\_\_\_\_ cm

Answer: 13 cm

[Check:  $(1/2)(9+13)(8) = (1/2)(22)(8) = 88$ ]

Q7: Area units are always in \_\_\_\_\_ units.

Answer: square

Q8: The non-parallel sides of a trapezium are called \_\_\_\_\_.

Answer: legs or oblique sides

Q9: Find the area:  $a = 22$  cm,  $b = 14$  cm,  $h = 10$  cm.

$$\text{Area} = (1/2)(22+14)(10) = (1/2)(36)(10) = 180 \text{ cm}^2$$

Q10: Area =  $130 \text{ cm}^2$ , parallel sides  $18$  cm and  $8$  cm. Find height.

$$130 = (1/2)(18+8)(h) = 13h$$

$$h = 10 \text{ cm}$$

Q11: How does area change if height is halved but parallel sides remain same?

$$\text{New Area} = (1/2)(a+b)(h/2) = (1/4)(a+b)(h)$$

$$= \text{Original area}/2$$

Area becomes HALF of original.

Q12: A trapezium has parallel sides  $25$  cm and  $15$  cm, height  $12$  cm. Another trapezium has parallel sides  $30$  cm and  $20$  cm, height  $8$  cm. Which has greater area?

$$\text{Trapezium 1: } (1/2)(25+15)(12) = (1/2)(40)(12) = 240 \text{ cm}^2$$

$$\text{Trapezium 2: } (1/2)(30+20)(8) = (1/2)(50)(8) = 200 \text{ cm}^2$$

Trapezium 1 has greater area ( $240 > 200$ ).

Q13: A trapezium-shaped garden has parallel sides  $35$  m and  $25$  m, height  $18$  m. The owner wants to: a) Find area of garden b) Plant flowers at ₹20 per  $\text{m}^2$  c) Fence the garden (non-parallel sides =  $20$  m and  $22$  m, cost = ₹150 per m) d) Find total expenditure

$$\text{a) Area} = (1/2)(35+25)(18)$$

$$= (1/2)(60)(18)$$

$$= 540 \text{ m}^2$$

$$\text{b) Flower cost} = 540 \times 20 = ₹10,800$$

$$\text{c) Perimeter} = 35 + 25 + 20 + 22 = 102 \text{ m}$$

$$\text{Fencing cost} = 102 \times 150 = ₹15,300$$

$$d) \text{ Total} = 10,800 + 15,300 = ₹26,100$$

## Real-Life Problems on Area of Trapezium

### Construction and Architecture

Question 14: A wall cross-section is trapezium-shaped with parallel sides 4 m (top) and 5 m (bottom), height 3 m. Find the area of the cross-section and the volume of material if the wall is 10 m long.

$$\text{Cross-section area} = (1/2)(4+5)(3)$$

$$= (1/2)(9)(3)$$

$$= 13.5 \text{ m}^2$$

$$\text{Volume} = \text{Area} \times \text{length} = 13.5 \times 10 = 135 \text{ m}^3$$

Answer: Area = 13.5 m<sup>2</sup>, Volume = 135 m<sup>3</sup>

### Land Measurement Problems

Question 15: A trapezium-shaped plot of land has parallel sides 80 m and 60 m, and perpendicular distance 40 m. Find the area in hectares. (1 hectare = 10,000 m<sup>2</sup>)

$$\text{Area} = (1/2)(80+60)(40)$$

$$= (1/2)(140)(40)$$

$$= 2,800 \text{ m}^2$$

$$\text{In hectares} = 2800/10000 = 0.28 \text{ hectares}$$

Answer: 0.28 hectares

Question 16: A trapezoidal table top has parallel sides of 120 cm and 80 cm, and width (height) of 70 cm. Find the area of the table top.

$$\text{Area} = (1/2)(120+80)(70)$$

$$= (1/2)(200)(70)$$

$$= 7,000 \text{ cm}^2$$

$$= 0.7 \text{ m}^2$$

Answer: 7,000 cm<sup>2</sup> or 0.7 m<sup>2</sup>

Question 17: A trapezoidal solar panel has parallel sides 1.2 m and 0.8 m, height 0.5 m. Find its area and the energy output if 1 m<sup>2</sup> generates 200 watts.

$$\text{Area} = (1/2)(1.2+0.8)(0.5)$$

$$= (1/2)(2)(0.5)$$

$$= 0.5 \text{ m}^2$$

$$\text{Energy output} = 0.5 \times 200 = 100 \text{ watts}$$

Answer: Area = 0.5 m<sup>2</sup>, Energy = 100 watts

### Practice Test on Area of Trapezium

#### Beginner Level

1.  $a=10, b=6, h=4 \rightarrow \text{Area} = ?$

Answer: 32 cm<sup>2</sup>

2.  $a=14, b=8, h=5 \rightarrow \text{Area} = ?$

Answer: 55 cm<sup>2</sup>

3.  $\text{Area}=40, a=10, b=6 \rightarrow h = ?$

Answer: 5 cm

4.  $a=18, b=12, h=8 \rightarrow \text{Area} = ?$

Answer: 120 cm<sup>2</sup>

5.  $a=25, b=15, h=10 \rightarrow \text{Area} = ?$

Answer: 200 cm<sup>2</sup>

**Intermediate Level**

6. Area=96 cm<sup>2</sup>, h=8 cm, a=15 cm → b=?

$$\text{Solution: } 96 = \frac{1}{2}(15+b)(8) = 4(15+b)$$

$$24 = 15 + b \rightarrow b = 9 \text{ cm}$$

7. Parallel sides in ratio 4:6, h=5cm, area=100cm<sup>2</sup> → sides?

$$4x + 6x = 10x$$

$$100 = \frac{1}{2}(10x)(5) = 25x \rightarrow x = 4$$

Sides = 16 cm and 24 cm

8. Trapezium area = rectangle area (20×9=180 cm<sup>2</sup>)

Sides 24 and 12 cm → height?

$$180 = \frac{1}{2}(24+12)(h) = 18h \rightarrow h = 10 \text{ cm}$$

9. a=2m, b=150cm, h=0.8m → Area in cm<sup>2</sup>?

Convert: a=200cm, b=150cm, h=80cm

$$\text{Area} = \frac{1}{2}(350)(80) = 14,000 \text{ cm}^2$$

10. Two identical trapeziums form a parallelogram

of area 250 cm<sup>2</sup>. Each has sides 20 and 10.

Find height of each.

$$\text{Each} = 125 \text{ cm}^2$$

$$125 = \frac{1}{2}(20+10)(h) = 15h \rightarrow h = 8.33 \text{ cm}$$