Exercise 18A

Q1.

Answer :

Area of a trapezium $= \frac{1}{2} \times$ (Sum of parallel sides) $\times$ (Distance between them)

$$= \left\{\frac{1}{2} \times (24 + 20) \times 15\right\} \text{ cm}^2$$
$$= \left(\frac{1}{2} \times 44 \times 15\right) \text{ cm}^2$$
$$= (22 \times 15) \text{ cm}^2$$
$$= 330 \text{ cm}^2$$

Hence, the area of the trapezium is 330 cm^2.

Q2.

Answer :

Area of a trapezium $= \frac{1}{2} \times$ (Sum of parallel sides) $\times$ (Distance between them)

$$= \left\{\frac{1}{2} \times (38.7 + 22.3) \times 16\right\} \text{ cm}^2$$
$$= \left(\frac{1}{2} \times 61 \times 16\right) \text{ cm}^2$$
$$= (61 \times 8) \text{ cm}^2$$
$$= 488 \text{ cm}^2$$

Hence, the area of the trapezium is 488 cm^2.

Q3.

Answer :

Area of a trapezium $= \frac{1}{2} \times$ (Sum of parallel sides) $\times$ (Distance between them)

$$= \left\{\frac{1}{2} \times (1 + 1.4) \times 0.9\right\} \text{ m}^2$$
$$= \left(\frac{1}{2} \times 2.4 \times 0.9\right) \text{ m}^2$$
$$= (1.2 \times 0.9) \text{ m}^2$$
$$= 1.08 \text{ m}^2$$

Hence, the area of the top surface of the table is 1.08 m^2.

Let the lengths of the parallel sides of the trapezium be $4x$ cm and $5x$ cm, respectively.

Now,

$$\text{Area of trapezium} = \left\{\frac{1}{2} \times (4x + 5x) \times 18\right\} \text{ cm}^2$$
$$= \left(\frac{1}{2} \times 9x \times 18\right) cm^2$$
$$= 81x \ cm^2$$

Area of trapezium $= 405$ cm^2 (Given)

$\therefore 81x = 405$

$\Rightarrow x = \frac{405}{81}$

$\Rightarrow x = 5$ cm

Length of one side $= (4 \times 5)$ cm $= 20$ cm

Length of the other side $= (5 \times 5)$ cm $= 25$ cm

Q7.

Answer :

Let the lengths of the parallel sides be x cm and $(x + 6)$ cm.

Now,

$$\text{Area of trapezium} = \left\{\frac{1}{2} \times (x + x + 6) \times 9\right\} \text{ cm}^2$$
$$= \left(\frac{1}{2} \times (2x + 6) \times 9\right) \text{ cm}^2$$
$$= 4.5(2x + 6) \text{ cm}^2$$
$$= (9x + 27) \text{ cm}^2$$

Area of trapezium $= 180$ cm^2 (Given)

$\therefore 9x + 27 = 180$

$\Rightarrow 9x = (180 - 27)$

$\Rightarrow 9x = 153$

$\Rightarrow x = \frac{153}{9}$

$\Rightarrow x = 17$

Hence, the lengths of the parallel sides are 17 cm and 23 cm, that is, $(17 + 6)$ cm.

Q8.

Answer :

Let the lengths of the parallel sides be x cm and $2x$ cm.

$$\text{Area of trapezium} = \left\{\frac{1}{2} \times (x + 2x) \times 84\right\} \text{ m}^2$$
$$= \left(\frac{1}{2} \times 3x \times 84\right) \text{ m}^2$$
$$= (42 \times 3x) \text{ m}^2$$
$$= 126x \text{ m}^2$$

Area of the trapezium $= 9450$ m^2 (Given)

$\therefore 126x = 9450$

$\Rightarrow x = \frac{9450}{126}$

$\Rightarrow x = 75$

Thus, the length of the parallel sides are 75 m and 150 m, that is, (2×75) m, and the length of the longer side is 150 m.

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