

RD SHARMA

Solutions

Class 7 Maths

Chapter 20

Ex 20.1

Q1: Find the area, in square meters, of a rectangle whose

(i) Length = 5.5 m, breadth = 2.4 m

(ii) Length = 180 cm, breadth = 150 cm

A1: We have,

(i) Length = 5.5 m, Breadth = 2.4 m Therefore, Area of rectangle = Length x Breadth = 5.5 m x 2.4 m = 13.2 m²

(ii) Length = 180 cm = 1.8 m, Breadth = 150 cm = 1.5 m [Since 100 cm = 1 m] Therefore, Area of rectangle = Length x Breadth = 1.8 m x 1.5 m = 2.7 m²

Q2: Find the area, in square centimeters, of a square whose side is

(i) 2.6 cm

(ii) 1.2 dm

A2: We have,

(i) Side of the square = 2.6 cm

Therefore, area of the square = (Side)² = (2.6 cm)² = 6.76 cm²

(ii) Side of the square = 1.2 dm = 1.2 x 10 cm = 12 cm

Therefore, area of the square = (Side)² = (12 cm)² = 144 cm² [Since 1 dm = 10 cm]

Q3: Find in square metres, the area of a square of side 16.5 dam.

A3: We have,

Side of the square = 16.5

dam = 16.5 x 10 m = 165 m

Area of the square = (Side)² = (165 m)² = 27225 m²

[Since 1 dam/dm (decameter) = 10 m]

Q4: Find the area of a rectangular field in acres whose sides are:

(I) 200 m and 125 m

(ii) 75 m 5 dm and 120 m

A4: We have,

(i) Length of the rectangular field = 200 m

Breadth of the rectangular field = 125 m

Therefore, Area of the rectangular field = Length x Breadth = 200 m x 125 m

= 25000 m² = 250 acres [Since 100 m² = 1 are]

(ii) Length of the rectangular field = 75 m 5 dm = (75 + 0.5) m

= 75.5 m [Since 1 dm = 10 cm = 0.1 m]

Breadth of the rectangular field = 120 m

Therefore, Area of the rectangular field = Length x Breadth

= 75.5 m x 120 m = 9060 m² = 90.6 acres [Since 100 m² = 1 are]

Q 5: Find the area of a rectangular field in hectares whose sides are:

(i) 125 m and 400 m

(ii) 75 m 5 dm and 120 m

A 5 : We have,

(i) Length of the rectangular field = 125 m

Breadth of the rectangular field = 400 m

Therefore, Area of the rectangular field = Length x Breadth

$$= 125 \text{ m} \times 400 \text{ m} = 50000 \text{ m}^2 = 5 \text{ hectares [Since } 10000 \text{ m}^2 = 1 \text{ hectare]}$$

(ii) Length of the rectangular field = 75 m 5 dm = (75 + 0.5) m

$$= 75.5 \text{ m [Since } 1 \text{ dm} = 10 \text{ cm} = 0.1 \text{ m]}$$

Breadth of the rectangular field = 120 m

Therefore, Area of the rectangular field = Length x Breadth

$$= 75.5 \text{ m} \times 120 \text{ m} = 9060 \text{ m}^2 = 0.906 \text{ hectares [Since } 10000 \text{ m}^2 = 1 \text{ hectare]}$$

Q6: A door of dimensions 3 m x 2 m is on the wall of dimension 10 m x 10 m. Find the cost of painting the wall if rate of painting is Rs 2.50 per sq. m.

A 6: We have,

Length of the door = 3 m

Breadth of the door = 2 m

Side of the wall = 10 m

Area of the wall = Side x Side = 10 m x 10 m

$$= 100 \text{ m}^2$$

Area of the door = Length x Breadth = 3 m x 2 m = 6 m

Thus, required area of the wall for painting = Area of the wall – Area of the door

$$= (100 - 6) \text{ m}^2 = 94 \text{ m}^2$$

Rate of painting per square metre = Rs. 2.50

Hence, the cost of painting the wall = Rs. (94 x 2.50) = Rs. 235

Q7: A wire is in the shape of a rectangle. Its length is 40 cm and breadth is 22 cm. If the same wire is bent in the shape of a square, what will be the measure of each side? Also, find which side encloses more area?

A7: We have,

Perimeter of the rectangle = 2(Length + Breadth)

$$= 2(40 \text{ cm} + 22 \text{ cm}) = 124 \text{ cm}$$

It is given that the wire which was in the shape of a rectangle is now bent into a square.

Therefore, the perimeter of the square = Perimeter of the rectangle

$$\Rightarrow \text{Perimeter of the square} = 124 \text{ cm}$$

$$4 \times \text{side} = 124 \text{ cm}$$

$$\text{Side} = 124/4 = 31 \text{ cm}$$

Now, Area of the rectangle = 40 cm x 22 cm = 880 cm²

$$\text{Area of the square} = (\text{Side})^2 = (31 \text{ cm})^2 = 961 \text{ cm}^2.$$

Therefore, the square-shaped wire encloses more area.

Q8: How many square metres of glass will be required for a window, which has 12 panes, each pane measuring 25 cm by 16 cm?

A8: We have,

Length of the glass pane = 25 cm

Breadth of the glass pane = 16 cm

Area of one glass pane = 25 cm x 16 cm

$$= 400 \text{ cm}^2 = 0.04 \text{ m}^2$$

[Since 1 m² = 10000 cm²]

Thus, Area of 12 such panes = 12 x 0.04 = 0.48 m²

Q9: A marble tile measures 10 cm x 12 cm. How many tiles will be required to cover a wall of size 3 m x 4 m? Also, find the total cost of the tiles at the rate of Rs 2 per tile.

A9: We have,

$$\text{Area of the wall} = 3 \text{ m} \times 4 \text{ m} = 12 \text{ m}^2$$

$$\text{Area of one marble tile} = 10 \text{ cm} \times 12 \text{ cm}$$

$$= 120 \text{ c m}^2 = 0.012 \text{ m}^2 \text{ [Since } 1 \text{ m}^2 = 10000 \text{ c m}^2 \text{]}$$

$$\text{Thus, Number of tiles} = \text{Area of wall}$$

$$\text{Area of one tile} = 12 \text{ m}^2 = 0.012 \text{ m}^2 = 1000$$

$$\text{Cost of one tile} = \text{Rs. } 2$$

$$\text{Total cost} = \text{Number of tiles} \times \text{Cost of one tile}$$

$$= \text{Rs. } (1000 \times 2)$$

$$= \text{Rs. } 2000$$

Q10: A table top is 9 dm 5 cm long 6 dm 5 cm broad. What will be the cost to polish it at the rate of 20 paise per square centimetre?

A10: We have,

$$\text{Length of the table top} = 9 \text{ dm } 5 \text{ cm} = (9 \times 10 + 5) \text{ cm} = 95 \text{ cm} \text{ [Since } 1 \text{ dm} = 10 \text{ cm]}$$

$$\text{Breadth of the table top} = 6 \text{ dm } 5 \text{ cm} = (6 \times 10 + 5) \text{ cm} = 65 \text{ cm}$$

$$\text{Area of the table top} = \text{Length} \times \text{Breadth} = (95 \text{ cm} \times 65 \text{ cm}) = 6175 \text{ c m}^2$$

$$\text{Rate of polishing per square centimetre} = 20 \text{ paise} = \text{Rs. } 0.20$$

$$\text{Total cost} = \text{Rs. } (6175 \times 0.20) = \text{Rs. } 1235$$

Q11: A room is 9.68 m long and 6.2 m wide. Its floor is to be covered with rectangular tiles of size 22 cm by 10 cm. Find the total cost of the tiles at the rate of Rs 2.50 per tile.

A11: We have,

$$\text{Length of the floor of the room} = 9.68 \text{ m}$$

$$\text{Breadth of the floor of the room} = 6.2 \text{ m}$$

$$\text{Area of the floor} = 9.68 \text{ m} \times 6.2 \text{ m} = 60.016 \text{ m}^2$$

$$\text{Length of the tile} = 22 \text{ cm}$$

$$\text{Breadth of the tile} = 10 \text{ cm}$$

$$\text{Area of one tile} = 22 \text{ cm} \times 10 \text{ cm} = 220 \text{ c m}^2 = 0.022 \text{ m}^2 \text{ [Since } 1 \text{ m}^2 = 10000 \text{ c m}^2 \text{]}$$

$$\text{Thus, Number of tiles} = 60.016 \text{ m}^2 / 0.022 \text{ m}^2 = 2728$$

$$\text{Cost of one tile} = \text{Rs. } 2.50$$

$$\text{Total cost} = \text{Number of tiles} \times \text{Cost of one tile} = \text{Rs. } (2728 \times 2.50) = \text{Rs. } 6820$$

Q12: One side of a square field is 179 m. Find the cost of raising a lawn on the field at the rate of Rs 1.50 per square metre.

A12: We have,

$$\text{Side of the square field} = 179 \text{ m}$$

$$\text{Area of the field} = (\text{Side})^2 = (179 \text{ m})^2 = 32041 \text{ m}^2$$

$$\text{Rate of raising a lawn on the field per square metre} = \text{Rs. } 1.50 \text{ Thus,}$$

$$\text{Total cost of raising a lawn on the field} = \text{Rs. } (32041 \times 1.50) = \text{Rs. } 48061.50$$

Q13: A rectangular field is measured 290 m by 210 m. How long will it take for a girl to go two times round the field, if she walks at the rate of 1.5 m/sec?

A13: We have,

Length of the rectangular field = 290 m
 Breadth of the rectangular field = 210 m
 Perimeter of the rectangular field = $2(\text{Length} + \text{Breadth}) = 2(290 + 210) = 1000$ m
 Distance covered by the girl = $2 \times \text{Perimeter of the rectangular field} = 2 \times 1000 = 2000$ m
 The girl walks at the rate of 1.5 m/sec. Or, Rate = 1.5×60 m/min = 90 m/min
 Thus, required time to cover a distance of 2000 m = $2000 \text{ m} / 90 \text{ m/min}$
 = $22\frac{2}{9}$ min
 Hence, the girl will take $22\frac{2}{9}$ min to go two times around the field.

Q14: A corridor of a school is 8 m long and 6 m wide. It is to be covered with canvas sheets. If the available canvas sheets have the size 2 m x 1 m, find the cost of canvas sheets required to cover the corridor at the rate of Rs 8 per sheet.

A14: We have,
 Length of the corridor = 8 m
 Breadth of the corridor = 6 m
 Area of the corridor of a school = Length x Breadth = (8 m x 6 m) = 48 m²
 Length of the canvas sheet = 2 m
 Breadth of the canvas sheet = 1 m
 Area of one canvas sheet = Length x Breadth = (2 m x 1 m) = 2 m²
 Thus, Number of canvas sheets = $48 \text{ m}^2 / 2 \text{ m}^2 = 24$
 Cost of one canvas sheet = Rs. 8
 Total cost of the canvas sheets = Rs. (24 x 8) = Rs. 192

Q15: The length and breadth of a playground are 62 m 60 cm and 25 m 40 cm respectively. Find the cost of turfing it at Rs 2.50 per square metre. How long will a man take to go three times round the field, if he walks at the rate of 2 metres per second?

A15: We have,
 Length of a playground = 62 m 60 cm = 62.6 m [Since 10 cm = 0.1 m]
 Breadth of a playground = 25 m 40 cm = 25.4 m
 Area of a playground = Length x Breadth = 62.6 m x 25.4 m = 1590.04 m²
 Rate of turfing = Rs. 2.50/ m² Total cost of turfing = Rs. (1590.04 x 2.50) = Rs. 3975.10
 Again, Perimeter of a rectangular field = $2(\text{Length} + \text{Breadth}) = 2(62.6 + 25.4) = 176$ m
 Distance covered by the man in 3 rounds of a field = $3 \times \text{Perimeter of a rectangular field}$
 = $3 \times 176 \text{ m} = 528$ m
 The man walks at the rate of 2 m/sec. Or, Rate = 2×60 m/min = 120 m/min
 Thus, required time to cover a distance of 528 m = $528 \text{ m} / 120 \text{ m/min} = 4.4$ min
 = 4 minutes 24 seconds [Since 0.1 minutes = 6 seconds]

Q16: A lane 180 m long and 5 m wide is to be paved with bricks of length 20 cm and breadth 15 cm. Find the cost of bricks that are required, at the rate of Rs 750 per thousand.

A16: We have,
 Length of the lane = 180 m
 Breadth of the lane = 5 m
 Area of a lane = Length x Breadth = 180 m x 5 m = 900 m²
 Length of the brick = 20 cm
 Breadth of the brick = 15 cm
 Area of a brick = Length x Breadth = 20 cm x 15 cm

$$= 300 \text{ cm}^2 = 0.03 \text{ m}^2 \text{ [Since } 1 \text{ m}^2 = 10000 \text{ cm}^2\text{]}$$

$$\text{Required number of bricks} = 900 \text{ m}^2 / 0.03 \text{ m}^2 = 30000$$

$$\text{Cost of 1000 bricks} = \text{Rs. } 750$$

$$\text{Total cost of 30,000 bricks} = \text{Rs. } 750 \times 30,000 / 1000 = \text{Rs. } 22,500$$

Q 17: How many envelopes can be made out of a sheet of paper 125 cm by 85 cm; supposing one envelope requires a piece of paper of size 17 cm by 5 cm?

A 17: We have,

$$\text{Length of the sheet of paper} = 125 \text{ cm}$$

$$\text{Breadth of the sheet of paper} = 85 \text{ cm}$$

$$\text{Area of a sheet of paper} = \text{Length} \times \text{Breadth} = 125 \text{ cm} \times 85 \text{ cm} = 10,625 \text{ cm}^2$$

$$\text{Length of sheet required for an envelope} = 17 \text{ cm}$$

$$\text{Breadth of sheet required for an envelope} = 5 \text{ cm}$$

$$\text{Area of the sheet required for one envelope} = \text{Length} \times \text{Breadth}$$

$$= 17 \text{ cm} \times 5 \text{ cm} = 85 \text{ cm}^2$$

$$\text{Thus, required number of envelopes} = 10,625 \text{ cm}^2 / 85 \text{ cm}^2 = 125$$

Q18: The width of a cloth is 170 cm. Calculate the length of the cloth required to make 25 diapers, if each diaper requires a piece of cloth of size 50 cm by 17 cm.

A18:

We have,

$$\text{Length of the diaper} = 50 \text{ cm}$$

$$\text{Breadth of the diaper} = 17 \text{ cm}$$

$$\text{Area of cloth to make 1 diaper} = \text{Length} \times \text{Breadth} = 50 \text{ cm} \times 17 \text{ cm} = 850 \text{ cm}^2$$

$$\text{Thus, Area of 25 such diapers} = (25 \times 850) \text{ cm}^2 = 21,250 \text{ cm}^2$$

$$\text{Area of total cloth} = \text{Area of 25 diapers} = 21,250 \text{ cm}^2$$

$$\text{It is given that width of a cloth} = 170 \text{ cm}$$

$$\text{Length of the cloth} = \text{Area of cloth}$$

$$\text{Width of a cloth} = 21,250 \text{ cm} / 170 \text{ cm} = 125 \text{ cm}$$

Hence, length of the cloth will be 125 cm.

Q19: The carpet for a room 6.6 m by 5.6 m costs Rs 3960 and it was made from a roll 70 cm wide. Find the cost of the carpet per metre.

A19:

We have,

$$\text{Length of a room} = 6.6 \text{ m}$$

$$\text{Breadth of a room} = 5.6 \text{ m}$$

$$\text{Area of a room} = \text{Length} \times \text{Breadth} = 6.6 \text{ m} \times 5.6 \text{ m} = 36.96 \text{ m}^2$$

$$\text{Width of a carpet} = 70 \text{ cm} = 0.7 \text{ m} \text{ [Since } 1 \text{ m} = 100 \text{ cm]}$$

$$\text{Length of a carpet} = \text{Area of a room}$$

$$\text{Width of a carpet} = 36.96 \text{ m} / 0.7 \text{ m} = 52.8 \text{ m}$$

$$\text{Cost of 52.8 m long roll of carpet} = \text{Rs. } 3960$$

$$\text{Therefore, Cost of 1 m long roll of carpet} = \text{Rs. } 3960 / 52.8 = \text{Rs. } 75$$

Q20: A room is 9 m long, 8 m broad and 6.5 m high. It has one door of dimensions 2 m x 1.5 m and three windows each of dimensions 1.5 m x 1 m. Find the cost of white T4L washing the walls at Rs 3.80 per square metre.

A20: We have,

Length of a room = 9 m

Breadth of a room = 8 m

Height of a room = 6.5 m

Area of 4 walls = $2(l + b)h = 2(9 \text{ m} + 8 \text{ m}) \times 6.5 \text{ m} = 2 \times 17 \text{ m} \times 6.5 \text{ m} = 221 \text{ m}^2$

Length of a door = 2 m

Breadth of a door = 1.5 m

Area of a door = Length \times Breadth = $2 \text{ m} \times 1.5 \text{ m} = 3 \text{ m}^2$

Length of a window = 1.5 m

Breadth of a window = 1 m

Since, area of one window = Length \times Breadth = $1.5 \text{ m} \times 1 \text{ m} = 1.5 \text{ m}^2$

Thus, Area of 3 such windows = $3 \times 1.5 \text{ m}^2 = 4.5 \text{ m}^2$

Area to be white-washed = Area of 4 walls – (Area of one door + Area of 3 windows)

Area to be white-washed = $[221 - (3 + 4.5)] \text{ m}^2 = (221 - 7.5) \text{ m}^2 = 213.5 \text{ m}^2$

Cost of white-washing for 1 m^2 area = Rs. 3.80

Cost of white-washing for 213.5 m^2 area = Rs. $(213.5 \times 3.80) = \text{Rs. } 811.30$

Q21: A hall 36 m long and 24 m broad allowing 80 m² for doors and windows, the cost of papering the walls at Rs 8.40 per m² is Rs 9408. Find the height of the hall.

A21: We have,

Length of the hall = 36 m

Breadth of the hall = 24 m

Let h be the height of the hall.

Now, in papering the wall, we need to paper the four walls excluding the floor and roof of the hall. So, the area of the wall which is to be papered = Area of 4 walls

$$= 2h(l + b)$$

$$= 2h(36 + 24)$$

$$= 120h \text{ m}^2$$

Now, area left for the door and the windows = 80 m^2

So, the area which is actually papered = $(120h - 80) \text{ m}^2$

Again, The cost of papering the walls at Rs 8.40 per m² = Rs. 9408

$$\Rightarrow (120h - 80) \text{ m}^2 \times \text{Rs. } 8.40 \text{ per m}^2 = \text{Rs. } 9408$$

$$\Rightarrow (120h - 80) \text{ m}^2 = \text{Rs. } 9408 / \text{Rs. } 8.40$$

$$\Rightarrow (120h - 80) \text{ m}^2 = 1120 \text{ m}^2$$

$$\Rightarrow 120h \text{ m}^2 = (1120 + 80) \text{ m}^2$$

$$\Rightarrow 120h \text{ m}^2 = 1200 \text{ m}^2$$

$$h = 1200 \text{ m}^2 / 120 \text{ m} = 10 \text{ m}$$

Hence, the height of the wall would be 10 m.