NCERT Solutions for 7th Class Maths: Chapter 11-Perimeter and Area

NCERT Solutions for 7th Class Maths: Chapter 11-Perimeter and Area

Class 7: Maths Chapter 11 solutions. Complete Class 7 Maths Chapter 11 Notes.

NCERT Solutions for 7th Class Maths: Chapter 11-Perimeter and Area

NCERT 7th Maths Chapter 11, class 7 Maths Chapter 11 solutions

Exercise 11.1

1. The length and breadth of a rectangular piece of land are 500 m and 300 m respectively. Find:

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(i) Its area.

(ii) The cost of the land, if 1 m^2 of the land costs Rs 10,000.

Answer

From the question it is given that,

Length of the rectangular piece of land = 500 m

Breadth of the rectangular piece of land = 300 m

Then,

(i) Area of rectangle = Length × Breadth

= 500 × 300

= 15,0000 m^2

(ii) Cost of the land for 1 m^2 = Rs. 10000

Cost of the land for 150000 m^2 = 10000 × 150000

= Rs. 15,00000000.

2. Find the area of a square park whose perimeter is 320 m.

Answer

From the question it is given that,

Perimeter of the square park = 320 m

4 × Length of the side of park = 320 m

Then,

Length of the side of park = 320/4 = 80 m

So, Area of the square park = (length of the side of park)^2 = $(80)^2$ m^2 = 6400 m^2

3. Find the breadth of a rectangular plot of land, if its area is 440 m^2 and the length is 22 m. Also find its perimeter.

Answer

Area of rectangular park = 440 m^2

⇒ length × breadth = 440 m^2

⇒ 22 × breadth = 440

⇒ breadth = 440/20 = 20 m

Now, Perimeter of rectangular park

= 2 [length + breadth]

= 2 [22 + 20]

= 2 × 42 = 84 m

Thus, the perimeter of rectangular park is 84 m.

4. The perimeter of a rectangular sheet is 100 cm. If the length is 35 cm, find its breadth. Also find the area.

Answer

Perimeter of the rectangular sheet = 100 cm

⇒ 2 (length + breadth) = 100 cm

⇒ 2 (35 + breadth) = 100

⇒ 35 + breadth = 100/2

⇒ 35 + breadth = 50

⇒ breadth = 50 - 35

⇒ breadth = 15 cm

Now, Area of rectangular sheet = length x breadth

= 35 × 15 = 525 cm^2

Thus, breadth and area of rectangular sheet are 15 cm and 525 cm^2 respectively.

5. The area of a square park is the same as a rectangular park. If the side of the square park is 60 m and the length of the rectangular park is 90 cm, find the breadth of the rectangular park.

Answer

Given:

The side of the square park = 60 m

The length of the rectangular park = 90 m

According to the question,

Area of square park = Area of rectangular park

⇒ side × side = length × breadth

⇒ 60 × 60 = 90 × breadth

⇒ breadth = 60 × 60/ = 40m

Thus, the breadth of the rectangular park is 40 m.

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

Answer

According to the question,

Perimeter of square = Perimeter of rectangle

⇒ 4 × side = 2 (length + breadth)

⇒ 4 × side = 2 (40 + 22)

⇒ 4 × side = 2 × 62

⇒ side = 2 × 62/4 = 31 cm

Thus, the side of the square is 31 cm.

Now, Area of rectangle = length × breadth = 40 × 22 = 880 cm^2

And Area of square = side × side = 31 × 31 = 961 cm^2

Therefore, on comparing, the area of square is greater than that of rectangle.

7. The perimeter of a rectangle is 130 cm. If the breadth of the rectangle is 30 cm, find its length. Also, find the area of the rectangle.

Answer

Perimeter of rectangle = 130 cm

⇒ 2 (length + breadth) = 130 cm

⇒ 2 (length + 30) = 130

⇒ length + 30 = 130/2

⇒ length + 30 = 65

⇒ length = 65 - 30 = 35 cm

Now area of rectangle = length × breadth = 35 × 30 = 1050 cm^2

Thus, the area of rectangle is 1050 cm^2.

8. A door of length 2 m and breadth 1 m is fitted in a wall. The length of the wall is 4.5 m and the breadth is 3.6 m. Find the cost of white washing the wall, if the rate of white washing the wall is Rs 20 per m^2.

Fig 11.6

Answer

Area of rectangular door = length × breadth = 2 m × 1 m = 2 m2

Area of wall including door = length × breadth = 4.5 m × 3.6 m = 16.2 m2

Now, Area of wall excluding door = Area of wall including door - Area of door = 16.2-2 = 14.2 m2

Since, the rate of white washing of 1 m2 the wall = Rs 20

Therefore, the rate of white washing of 14.2 m2 the wall = 20 × 14.2 = Rs 284

Thus, the cost of white washing the wall excluding the door is Rs 284.

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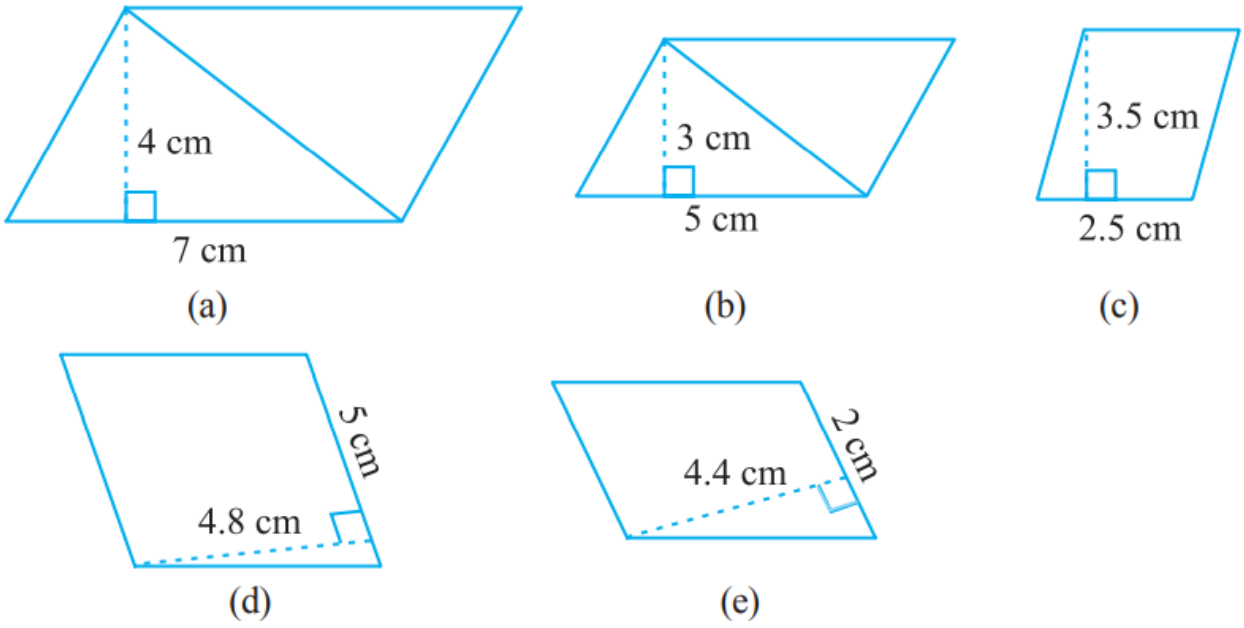
Exercise 11.2

1. Find the area of each of the following parallelograms:



Answer

We know that the area of parallelogram = base x height

(a) Here base = 7 cm and height = 4 cm

∴ Area of parallelogram = 7×4 = 28 cm^2

(b) Here base = 5 cm and height = 3 cm

∴ Area of parallelogram = 5×3 = 15 cm^2

(c) Here base = 2.5 cm and height = 3.5 cm

∴ Area of parallelogram = 2.5 × 3.5 = 8.75 cm^2

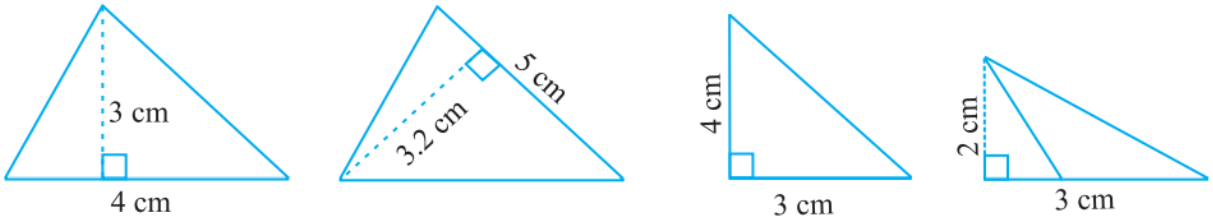
(d) Here base = 5 cm and height = 4.8 cm

∴ Area of parallelogram = 5 × 4.8 = 24 cm^2

(e) Here base = 2 cm and height = 4.4 cm

∴ Area of parallelogram = 2 × 4.4 = 8.8 cm^2

2. Find the area of each of the following triangles:



(a) (b) (c) (d)

Answer

We know that the area of triangle

= 1/2×base×height

(a) Here, base = 4 cm and height = 3 cm

∴ Area of triangle

= 1/2×4×3 = 6 cm^2

(b) Here, base = 5 cm and height = 3.2 cm

∴ Area of triangle

= 1/2×5×3.2 = 8 cm^2

(c) Here, base = 3 cm and height = 4 cm

∴ Area of triangle

= 1/2×3×4 = 6 cm^2

(d) Here, base = 3 cm and height = 2 cm

∴ Area of triangle

3. Find the missing values:

S. No.	Base	Height	Area of the parallelogram
a.	20 cm		246 cm^2
b.		15 cm	154.5 cm^2
c		84 cm	48.72 cm^2
d.	15.6 cm		16.72 cm^2

Answer

We know that the area of parallelogram = base x height

(a) Here, base = 20 cm and area = 246 cm^2

∴ Area of parallelogram = base × height

⇒ 246 = 20 × height

⇒ height = 246/20 = 12.3 cm

(b) Here, height = 15 cm and area = 154.5 cm^2

∴ Area of parallelogram = base × height

⇒ 154.5 = base × 15

⇒ base = 154.5/15 = 10.3 cm

(c) Here, height = 8.4 cm and area = 48.72 cm^2

∴ Area of parallelogram = base × height

⇒ 48.72 = base × 8.4

⇒ base = 48.72/8.4 = 5.8 cm

(d) Here, base = 15.6 cm and area = 16.38 cm^2

∴ Area of parallelogram = base × height

⇒ 16.38 = 15.6 × height

⇒ height = 16.38/15.6 = 1.05 cm

Thus, the missing values are:

S. No.	Base	Height	Area of the parallelogram
a.	20 cm	**12.3 cm**	246 cm^2
b.	**10.3 cm**	15 cm	154.5 cm^2
c	**5.8 cm**	84 cm	48.72 cm^2
d.	15.6 cm	**1.05**	16.72 cm^2

4. Find the missing values:

Base	Height	Area of triangle
15 cm	_____	87 cm^2
_____	31.4 mm	1256 mm^2
22 cm	_____	170.5 cm^2

Answer

We know that the area of triangle

= /2 × base × height

In first row, base = 15 cm and area = 87 cm^2

∴ 87 = 1/2 × 15 × height

⇒ height = 87 × 2/15 = 11.6 cm

In second row, height = 31.4 mm and area = 1256 mm^2

∴ 1256 = 1/2 × base × 31.4

⇒ base = 1256 × 2/31.4 = 80 mm

In third row, base = 22 cm and area = 170.5 cm^2

∴ 170.5 = 1/2 × 22 × height

⇒ height = 170.5 × 2/22 = 15.5 cm

Thus, the missing values are:

Base	Height	Area of triangle
15 cm	**11.6 cm**	87 cm^2
80 mm	31.4 mm	1256 mm^2
22 cm	**15.5 cm**	170.5 cm^2

5. PQRS is a parallelogram (Fig 11.23), QM is the height from Q to SR and QN is the height from Q to PS. If SR = 12 cm and QM = 7.6 cm. Find:

(a) the area of the parallelogram PQRS

(b) QN, if PS = 8 cm

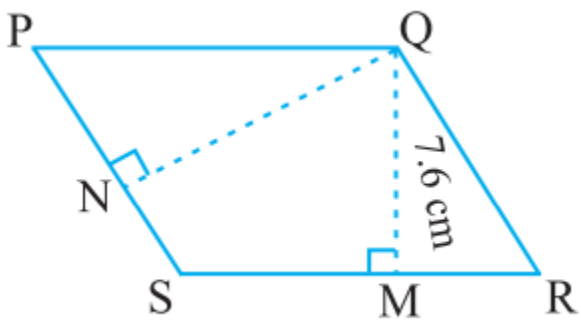


Fig 11.23

Answer

Given:

SR = 12 cm, QM = 7.6 cm, PS = 8 cm,

(a) Area of parallelogram = base × height

= 12 x 7.6 = 91.2 cm^2

(b) Area of parallelogram = base × height

⇒ 91.2 = 8 × QN

⇒ QN = 91.2/8 = 11.4 cm

6. DL and BM are the heights on sides AB and AD respectively of parallelogram ABCD (Fig 11.24). If the area of the parallelogram is 1470 cm2, AB = 35 cm and AD = 49 cm, Find the length of BM and DL.

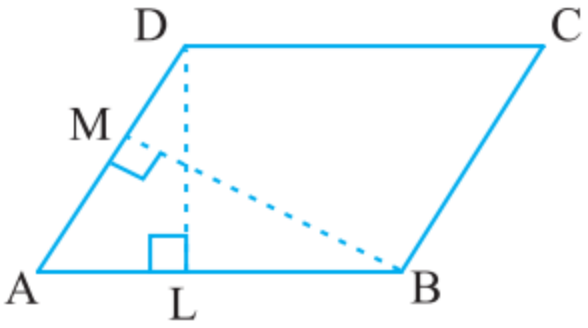


Fig 11.24

Answer

Given:

Area of parallelogram = 1470 cm^2

Base (AB) = 35 cm and base (AD) = 49 cm

Since Area of parallelogram = base × height

⇒ 1470 = 35 × DL

⇒ DL = 1470/35

⇒ DL = 42 cm

Again, Area of parallelogram = base × height

⇒ 1470 = 49 × BM

⇒ BM = 1470/49

⇒ BM = 30 cm

Thus, the lengths of DL and BM are 42 cm and 30 cm respectively.

7. Δ ABC is right angled at A (Fig 11.25). AD is perpendicular to BC. If AB = 5 cm, BC = 13 cm and AC = 12 cm, find the area of Δ ABC. Also, find the length of AD.

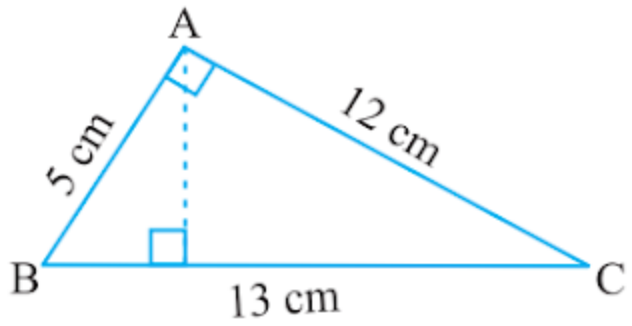


Fig 11.25

Answer

Area = 1/2 × Base × Height = 1/2 × 5 × 12

= 30 cm2

Also, area of triangle = 1/2 × AD × BC

30 = 1/2 × AD × 13

30×2/13 = AD

AD = 4.6 cm

8. ΔABC is isosceles with AB = AC = 7.5 cm and BC = 9 cm (Fig 11.26). The height AD from A to BC, is 6 cm. Find the area of ΔABC. What will be the height from C to AB i.e., CE?

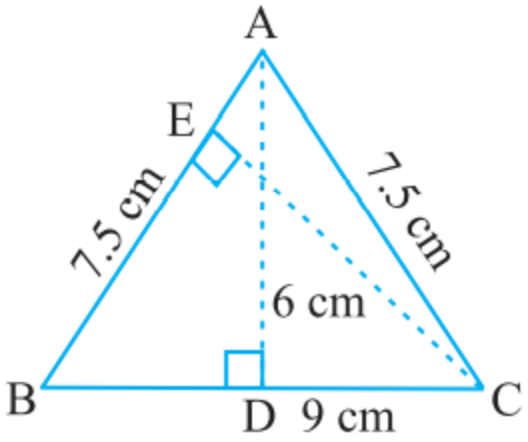


Fig 11.26

Answer

In ΔABC, AD = 6 cm and BC = 9 cm

Area of triangle = 1/2 × base × height = 1/2 × BC × AD

= 1/2 × 9 × 6 = 27 cm^2

Again, Area of triangle 1/2 × base × height = 1/2 × AB × CE

⇒ 27 = 1/2 × 7.5 × CE

⇒ CE = 27×2/7.5

⇒ CE = 7.2 cm.

Thus, height from C to AB i.e., CE is 7.2 cm.

NCERT 7th Maths Chapter 11, class 7 Maths Chapter 11 solutions

Exercise 11.3

1. Find the circumference of the circles with the following radius: (Take π = 22/7)

(a) 14 cm

(b) 28 mm

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(c) 21 cm

Answer

(a) A circumference of the circle = $2\pi r = 2\times22/7\times14 = 88$ cm

(b) A circumference of the circle = $2\pi r = 2\times22/7\times28 = 176$ cm

(c) A circumference of the circle = $2\pi r = 2\times22/7\times21 = 132$ cm

2. Find the area of the following circles, given that: (Take π = 22/7)

(a) radius = 14 mm

(b) diameter = 49 m

(c) radius = 5 cm

Answer

(a) Area of Circle = $\pi r^2 = 22/7 \times 14 \times 14$

$= 22 \times 2 \times 14$

$= 616\ mm^2$

(b) Diameter = 49 m

∴ radius = 49/2 = 24.5 cm

∴ Area of Circle = $\pi r^2 = 22/7 \times 24.5 \times 24.5$

$= 22 \times 3.5 \times 24.5$

= 1886.5 m2

(c) Area of Circle = $\pi r^2 = 22/7 \times 5 \times 5$

= 550/7 cm2

3. If the circumference of a circular sheet is 154 m, find its radius. Also, find the area of the sheet. (Take π = 22/7)

Answer

Circumference of the circular sheet = 154 m

⇒ $2\pi r = 154$ m

⇒ $r = 154/2\pi$

⇒ $r = 154\times7/2\times22 = 24.5$ m

Now, Area of circular sheet = $\pi r^2 = 22/7\times24.5\times24.5$

= 22 x 3.5 x 24.5 = 1886.5 m^2

Thus, the radius and area of circular sheet are 24.5 m and 1886.5 m^2 respectively.

4. A gardener wants to fence a circular garden of diameter 21 m. Find the length of the rope he needs to purchase if he makes 2 rounds of a fence. Also, find the costs of the rope, if it cost Rs 4 per meter. (Take π = 22/7)

Answer

Diameter of the circular garden = 21 m

∴ Radius of the circular garden = 21/2 m

Now, Circumference of a circular garden = $2\pi r = 2\times22/7\times21/2$

= 22 × 3 = 66 m

The gardener makes 2 rounds of a fence so the total length of the rope of fencing

= 2 × 2πr

= 2 × 66 = 132 m

Since, the cost of 1 meter rope = Rs 4

Therefore, Cost of 132 meter rope = 4 × 132 = Rs 528.

5. From a circular sheet of radius 4 cm, a circle of radius 3 cm is removed. Find the area of the remaining sheet. (Take π = 3.14)

Answer

Radius of circular sheet (R) = 4 cm and radius of removed circle (r) = 3 cm

Area of the remaining sheet = Area of a circular sheet - Area of removed circle

= $\pi R^2 - \pi r^2 = \pi(R^2 - r^2)$

= $\pi(42 - 32) = \pi(16 - 9)$

= 3.14 × 7 = 21.98 cm2

Thus, the area of the remaining sheet is 21.98 cm^2.

6. Saima wants to put lace on the edge of a circular table cover of diameter 1.5 m. Find the length of the lace required and also find its cost if one meter of the lace costs Rs 15. (Take π = 3.14)

Answer

Diameter of the circular table cover = 1.5 m

∴ Radius of the circular table cover = 1.5/2 m

Circumference of circular table cover = 2πr = 2 × 3.14 × 1.5/2 = 4.71 m

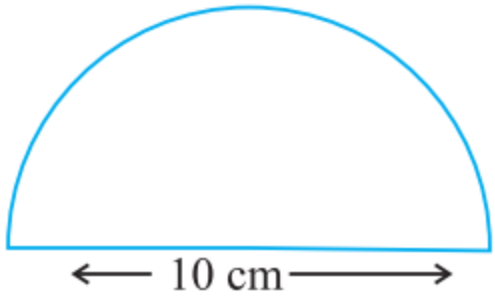
Therefore, the length of required lace is 4.71 m.

Now the cost of 1 m lace = Rs 15

Then the cost of 4.71 m lace = 15 × 4.71 = Rs 70.65

Hence, the cost of 4.71 m lace is Rs 70.65.

7. Find the perimeter of the adjoining figure, which is a semicircle including its diameter.



Answer

Diameter = 10 cm

Radius = 10/2 = 5 cm

According to question,

Perimeter of figure = Circumference of semicircle + diameter

= πr + D

= 22/7 × 5 +10 = 110/7 = 10

= 110/70 /7 = 180/7 = 25.71 cm

Thus, the perimeter of the given figure is 25.71 cm.

8. Find the cost of polishing a circular table-top of diameter 1.6 m, if the rate of polishing is Rs 15/m^2. (Take π = 3.14)

Answer

Diameter of the circular table top = 1.6 m

Radius of the circular table top = 1.6/2 = 0.8 m

Area of circular table top = πr^2 = 3.14 × 0.8 x 0.8 = 2.0096 m^2

Now, the cost of polishing 1 m^2 = Rs 15

Then cost of polishing 2.0096 m^2 = 15 × 2.0096 = Rs 30.14 (approx.)

Thus, The cost of polishing a circular table top is Rs 30.14 (approx.)

9. Shazli took a wire of length 44 cm and bent it into the shape of a circle. Find the radius of that circle. Also, find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area, the circle or the square? (Take π = 22/7)

Answer

Total length of the wire = 44 cm

∴ The circumference of the circle = 2πr = 44 cm

⇒ 2 × 22/7 × r = 44

⇒ r = 44×7/2×22 = 7 cm

Now Area of the circle = πr^2

= 22/7 × 7 × 7 = 154 cm^2

Now the wire is converted into the square.

The perimeter of square = 44 cm

⇒ 4 × side = 44

⇒ side = 44/4 = 11 cm

Now, area of square = side x side = 11 x 11 = 121 cm^2

Therefore, on comparing, the area of the circle is greater than that of a square, so the circle encloses more area.

10. From a circular card sheet of radius 14 cm, two circles of radius 3.5 cm and a rectangle of length 3 cm and breadth 1 cm are removed (as shown in the adjoining figure). Find the area of the remaining sheet. (Take π = 22/7)

Answer

Radius of circular sheet (R) = 14 cm and Radius of smaller circle (r) = 3.5 cm

Length of rectangle (l) = 3 cm and breadth of rectangle (b) = 1 cm

According to question,

Area of remaining sheet = Area of circular sheet- (Area of two smaller circle + Area of rectangle)

$= \pi r^2 - [2(\pi r^2)+(l+b)]$

$= 22/7 \times 14 \times 14 - [(2\times22/7\times3.5\times3.5)-(3\times1)]$

$=22\times14\times2 - [44\times0.5\times3.5+3]$

$=616 - 80$

$= 536\ cm^2$

Therefore, the area of the remaining sheet is 536 cm^2.

11. A circle of radius 2 cm is cut out from a square piece of an aluminum sheet of side 6 cm. What is the area of the leftover aluminum sheet? (Take π = 3.14)

Answer

Radius of circle = 2 cm and side of aluminium square sheet = 6 cm

According to question,

Area of aluminum sheet left = Total area of aluminum sheet - Area of circle

= side × side - πr^2

= 6 × 6 - 22/7 × 2 × 2

= 36 -12.56

= 23.44 cm^2

Therefore, the area of the aluminum sheet left is 23.44 cm^2.

12. The circumference of a circle is 31.4 cm. Find the radius and the area of the circle. (Take π = 3.14)

Answer

The circumference of the circle = 31.4 cm

⇒ $2\pi r = 31.4$

⇒ 2 × 3.14 × r = 31.4

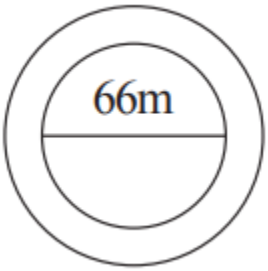
⇒ r = 31.4/2×3.14 = 5 cm

Then area of the circle = πr^2 = 3.14 x 5 x 5

= 78.5 cm^2

Therefore, the radius and the area of the circle are 5 cm and 78.5 cm^2 respectively.

13. A circular flower bed is surrounded by a path 4 m wide. The diameter of the flower bed is 66 m. What is the area of this path? (Take π = 3.14)



Answer

Diameter of the circular flower bed = 66 m

∴ Radius of circular flower bed (r) = 66/2 = 33 m

∴ Radius of circular flower bed with 4 m wide path (R) = 33 + 4 = 37 m

According to question,

Area of path = Area of bigger circle - Area of smaller circle

$= \pi R^2 - \pi r^2 = \pi(R^2 - r^2)$

$= \pi[(37)^2 - (33)^2]$

$= 3.14[(37+33)\ (37+33)]$ [$\because a^2 - b^2 = (a+b)(a-b)$]

$= 3.14 \times 70 \times 4$

$= 879.20\ m^2$

Therefore, the area of the path is 879.20 m^2.

14. A circular flower garden has an area of 314 m2. A sprinkler at the centre of the garden can cover an area that has a radius of 12 m. Will the sprinkler water the entire garden? (Take π = 3.14)

Answer

Circular area covered by the sprinkler = πr^2

$= 3.14 \times 12 \times 12$

$= 3.14 \times 144$

$= 452.16\ m^2$

Area of the circular flower garden = 314 m^2

As Area of the circular flower garden is smaller than area with a sprinkler. Therefore, the sprinkler will water the entire garden.

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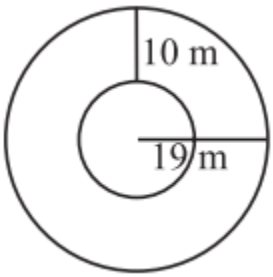
15. Find the circumference of the inner and the outer circles, shown in the adjoining figure. (Take π = 3.14)



Answer

Radius of outer circle (r) = 19 m

Circumference of outer circle = 2πr = 2 × 3.14 × 19 = 119.32 m

Now radius of inner circle (r') = 19 - 10 = 9 m

∴ Circumference of inner circle = 2πr' = 2 × 3.14 × 9 = 56.52 m

Therefore, the circumferences of inner and outer circles are 56.52 m and 119.32 m respectively.

16. How many times a wheel of radius 28 cm must rotate to go 352 m? (Take π = 22/7)

Answer

Let wheel must be rotated n times of its circumference.

Radius of wheel = 28 cm and Total distance = 352 m = 35200 cm

∴ Distance covered by wheel = n x circumference of wheel

⇒ 35200 = n×2πr

⇒ 35200 = n×2× 22/7 × 28

⇒ n = 35200×7/2×22×28

⇒ n = 200 revolutions

Thus, the wheel must rotate 200 times to go 352 m.

17. The minute hand of a circular clock is 15 cm long. How far does the tip of the minute hand move in 1 hour? (Take π = 3.14)

Answer

In 1 hour, minute hand completes one round means making a circle.

Radius of the circle (r) = 15 cm

A circumference of circular clock = 2πr

= 2 × 3.14 × 15

= 94.2 cm

Therefore, the tip of the minute hand moves 94.2 cm in 1 hour.

NCERT 7th Maths Chapter 11, class 7 Maths Chapter 11 solutions

Exercise 11.4

1. A garden is 90 m long and 75 m broad. A path 5 m wide is to be built outside and around it. Find the area of the path. Also find the area of the garden in hectares.

Answer

Length of rectangular garden = 90 m and breadth of rectangular garden = 75 m

Outer length of rectangular garden with path = 90 + 5 + 5 = 100 m

Outer breadth of rectangular garden with path = 75 + 5 + 5 = 85 m

Outer area of rectangular garden with path = length × breadth = 100 × 85 = 8,500 m^2

Inner area of garden without path = length x breadth = 90 × 75 = 6,750 m^2

Now, Area of path = Area of garden with path – Area of garden without path

= 8,500 – 6,750

= 1,750 m^2

Since, 1m^2 = 1/10000 hectares

Therefore, 6,750 m^2 = 6750/10000 = 0.675 hectares

2. A 3 m wide path runs outside and around a rectangular park of length 125 m and breadth 65 m. Find the area of the path.

Answer

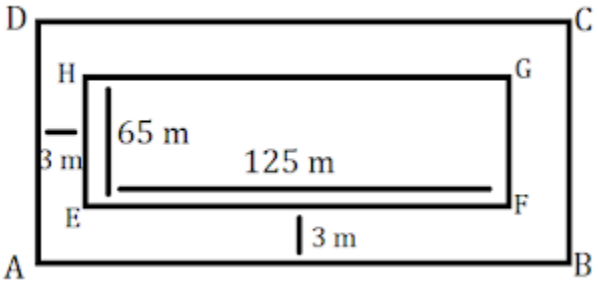
Length of rectangular park = 125 m

Breadth of rectangular park = 65 m

Width of the path = 3 m

Length of rectangular park with path = 125 + 3 + 3 = 131 m

Breadth of rectangular park with path = 65 + 3 + 3 = 71 m



∴ Area of path = Area of park with path - Area of park without path

= (AB × AD) - (EF x EH)

= (131 × 71) - (125 × 65)

= 9301 - 8125 = 1,176 m^2

Thus, area of path around the park is 1,176 m^2.

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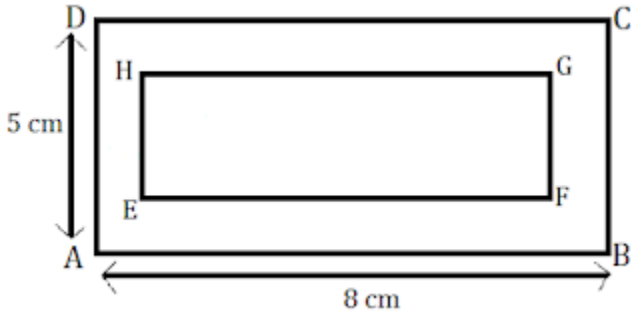
3. A picture is painted on a cardboard 8 cm long and 5 cm wide such that there is a margin of 1.5 cm along each of its sides. Find the total area of the margin.

Answer

Length of painted cardboard = 8 cm and breadth of painted card = 5 cm

Since, there is a margin of 1.5 cm long from each of its side.

Therefore reduced length = 8 – (1.5 + 1.5) = 8 – 3 = 5 cm



And reduced breadth = 5 - (1.5 + 1.5] = 5 - 3 = 2 cm

Area of margin = Area of cardboard (ABCD) - Area of cardboard (EFGH)

= (AB × AD) - (EF × EH)

= (8 × 5) - (5 × 2)

= 40 - 10

= 30 cm^2

Thus, total area of margin is 30 cm^2.

4. A verandah of width 2.25 m is constructed all along outside a room which is 5.5 m long and 4 m wide. Find:

(i) the area of the verandah.

(ii) the cost of cementing the floor of the verandah at the rate of Rs 200 per m^2.

Answer

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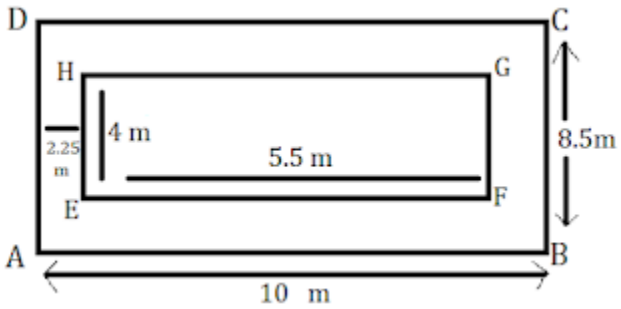
(i) The length of room = 5.5 m

Width of the room = 4 m

The length of room with verandah = 5.5 + 2.25 + 2.25 = 10 m

The width of room with verandah = 4 + 2.25 + 2.25 = 8.5 m



Area of verandah = Area of room with verandah – Area of room without verandah

= Area of ABCD – Area of EFGH

= (AB × AD) – (EF × EH)

= (10 × 8.5) – (5.5 × 4)

= 85 – 22

= 63 m2

(ii) The cost of cementing 1 m^2 the floor of verandah = Rs 200

The cost of cementing 63 m^2 the floor of verandah = 200 × 63 = Rs 12,600.

5. A path 1 m wide is built along the border and inside a square garden of side 30 m. Find:

(i) the area of the path.

(ii) the cost of planting grass in the remaining portion of the garden at the rate of Rs 40 per m^2.

Answer

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(i) Side of the square garden = 30 m and

Width of the path along the border = 1 m

Side of square garden without path = 30 – (1 + 1) = 30 – 2 = 28 m

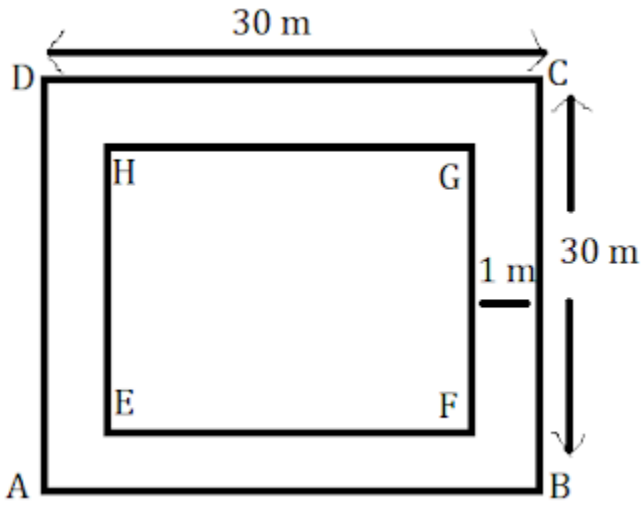
Now Area of path = Area of ABCD - Area of EFGH

= (AB × AD) - (EF × EH)

= (30 × 30) - (28 × 28)

= 900 - 784

= 116 m2



(ii) Area of remaining portion = 28 × 28 = 784 m2

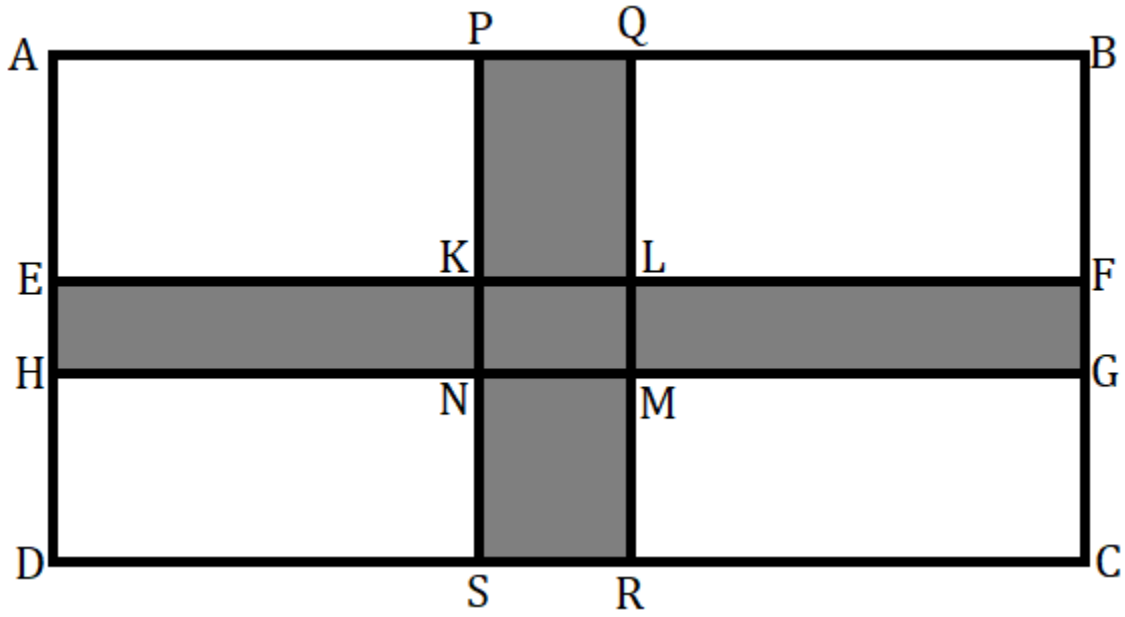
The cost of planting grass in 1 m^2 of the garden = Rs 40

The cost of planting grass in 784 m^2 of the garden = Rs 40 × 784 = Rs 31,360

6. Two cross roads, each of width 10 m, cut at right angles through the centre of a rectangular park of length 700 m and breadth 300 m and parallel to its sides. Find the area of the roads. Also find the area of the park excluding cross roads. Give the answer in hectares.

Answer

Here, PQ = 10 m and PS = 300 m, EH = 10 m and EF = 700 m And KL = 10 m and KN = 10 m



Area of roads = Area of PQRS + Area of EFGH - Area of KLMN

[∵ KLMN is taken twice, which is to be subtracted] = (PS × PQ) + (EF × EH) - (KL × KN)

= (300 × 10) + (700 × 10) - (10 × 10)

= 3000 + 7000 - 100

= 9,900 m2

Area of road in hectares, $1m^2$ = 1/10000 hectares

∴ 9,900 m^2 = 9900/10000 = 0.99 hectares

Now, Area of park excluding cross roads

= Area of park - Area of road

= (AB × AD) - 9,900 = (700 × 300) - 9,900

= 2,10,000 - 9,900

= 2,00,100 m^2

= 200100/10000 hectares = 20.01 hectares.

7. Through a rectangular field of length 90 m and breadth 60 m, two roads are constructed which are parallel to the sides and cut each other at right angles through the centre of the fields. If the width of each road is 3 m, find:

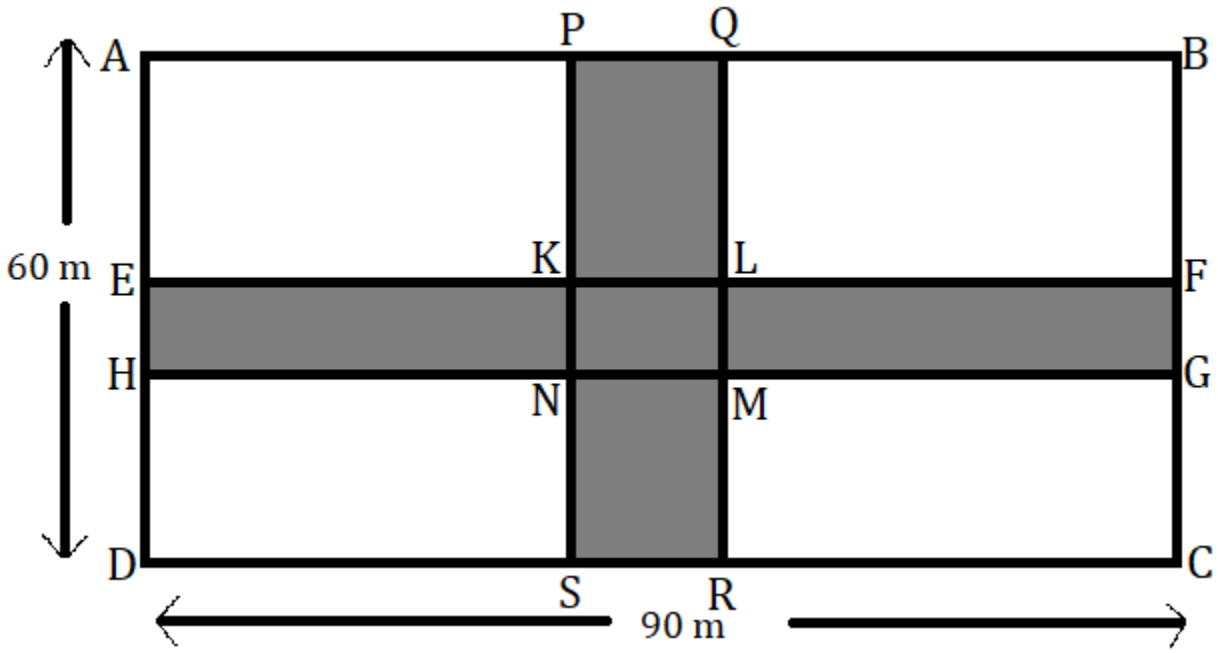
(i) the area covered by the roads.

(ii) the cost of constructing the roads at the rate of Rs 110 per m^2.

Answer

(i) Here, PQ = 3 m and PS = 60 m, EH = 3 m and

EF = 90 m and KL = 3 m and KN = 3 m



Area of roads = Area of PQRS + Area of EFGH - Area of KLMN

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[∵ KLMN is taken twice, which is to be subtracted]

= (PS × PQ) + (EF × EH) - (KL × KN)

= (60 × 3)+ (90 × 3) - (3 × 3)

= 180 + 270 - 9

= 441 m^2

(ii) The cost of 1 m^2 constructing the roads = Rs 110

The cost of 441 m^2 constructing the roads = Rs 110 × 441 = Rs 48,510

Therefore, the cost of constructing the roads = Rs 48,510.

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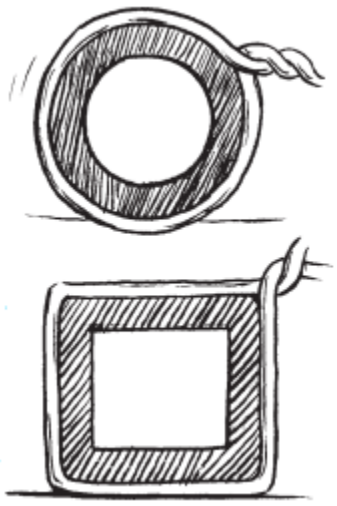
8. Pragya wrapped a cord around a circular pipe of radius 4 cm (adjoining figure) and cut off the length required of the cord. Then she wrapped it around a square box of side 4 cm (also shown). Did she have any cord left? (Take π = 3.14)



Answer

Radius of pipe = 4 cm

Wrapping cord around circular pipe = 2πr

= 2 × 3.14 × 4 = 25.12 cm

Again, wrapping cord around a square = 4 × side

= 4 x 4 = 16 cm

Remaining cord = Cord wrapped on pipe – Cord wrapped on square

= 25.12 – 16

= 9.12 cm

Thus, she is left with 9.12 cm cord.

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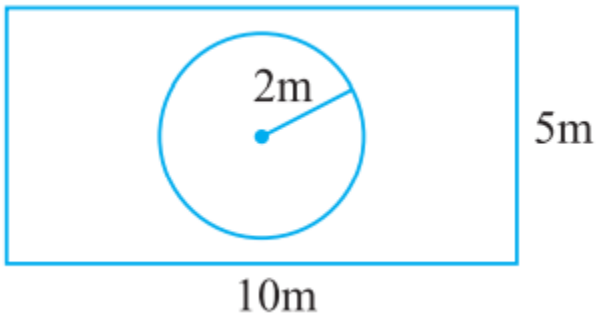
9. The adjoining figure represents a rectangular lawn with a circular flower bed in the middle. Find:



(i) the area of the whole land.

(ii) the area of the flower bed.

(iii) the area of the lawn excluding the area of the flower bed.

(iv) the circumference of the flower bed.

Answer

Length of rectangular lawn = 10 m, breadth of the rectangular lawn = 5 m

And radius of the circular flower bed = 2 m

(i) Area of the whole land = length x breadth = 10 × 5 = 50 m^2

(ii) Area of flower bed = πr^2

= 3.14 × 2 × 2 = 12.56 m^2

(iii) Area of lawn excluding the area of the flower bed = area of lawn - area of flower bed

= 50 - 12.56

= 37.44 m^2

(iv) The circumference of the flower bed = 2πr = 2 × 3.1 4 × 2 = 12.56 m.

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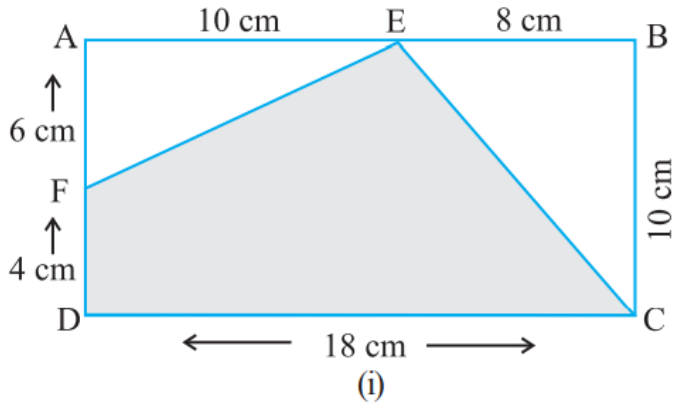
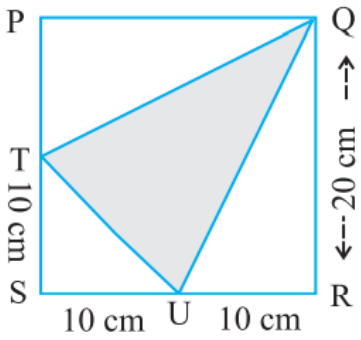
10. In the following figures, find the area of the shaded portions:



(i)



(ii)

Answer

(i) Here, AB = 18 cm, BC = 10 cm, AF = 6 cm, AE = 10 cm and BE = 8 cm

Area of shaded portion = Area of rectangle ABCD - (Area of Δ FAE + area of Δ EBC}

= (AB × BC) - (1/2 × AE × AF × + 1/2 × BE × BC)

= (18×10) - (1/2 × 10 × 6 + 1/2 × 8 × 10)

= 180 - (30+40)

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= 180-70

= 110 cm^2.

(ii) Here, SR = SU + UR = 10 + 10 = 20 cm, QR = 20 cm

PQ = SR = 20 cm

PT = PS - TS =(20 - 10)cm

TS = 10 cm, SU = 10 cm, QR = 20 cm and UR = 10 cm

Area of shaded region

= Area of square PQRS - Area of ΔQPT - Area of ΔTSU - Area of ΔUQR

= (SR × QR) - 1/2 × PQ × PT - 1/2 × ST × SU -1/2

= 20 × 20 - 1/2 × 20 × 10 - 1/2 × 10 × 10 - 1/2 × 20 × 10

= 400 - 100 - 50 - 100

= 150 cm^2

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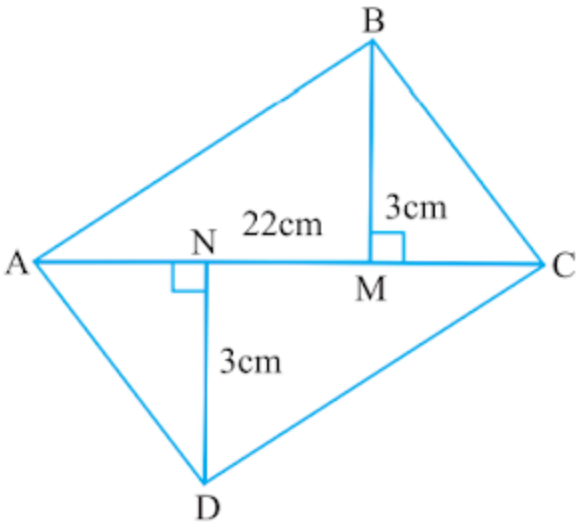
11. Find die area of the equilateral ABCD. Here, AC = 22 cm, BM = 3 cm, DN = 3 cm and BM ⊥ AC, DN ⊥ AC.



Answer

Here, AC = 22 cm, BM = 3 cm, DN = 3 cm

Area of quadrilateral ABCDF = Area of Δ ABC + Area of ΔADC

= 1/2 × AC × BM + 1/2 × AC × DN

= 1/2 × 22 × 3 + 1/2 × 22 × 3

= 3 × 11 + 3 × 11

= 33 + 33

= 66 cm^2

Thus, the area of quadrilateral ABCD is 66 cm^2.

NCERT 7th Maths Chapter 11, class 7 Maths Chapter 11 solutions

Chapterwise NCERT Solutions for Class 7 Maths :

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