

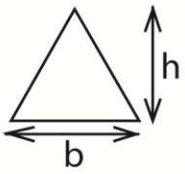
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Area

Area is the size of a surface.

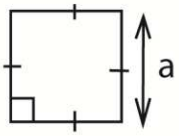
Formulae of the area of simple shapes

Triangle



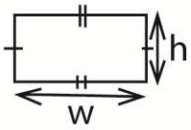
Area = ½ × b × h
b = base
h = vertical height

Square



Area = a^2
a = length of side

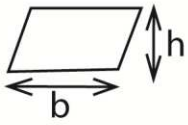
Rectangle



Area = w × h
w = width
h = height

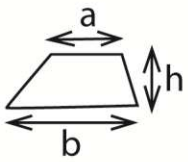
digitalteachers.co.ug

Parallelogram



Area = b × h
b = base
h = vertical height

Trapezium /trapezoid



Area = ½(a+b) × h
h = vertical height

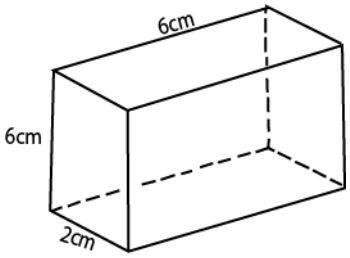
Circle



Area = π × r^2

Example

Find the area of the base of cuboid below.



Solution

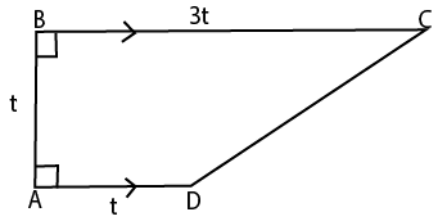
Area = length x width

= 2 x 6

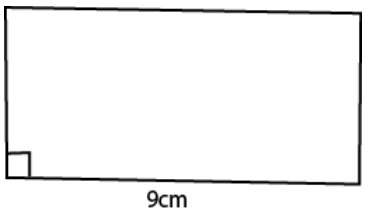
=12 cm^2

Revision Questions

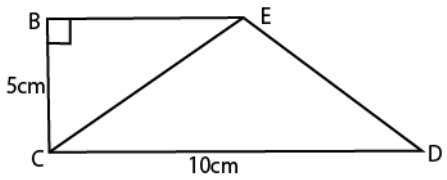
1. In the diagram below, ABCD: AD= t, BC=3t and AB = t. If the area of ABCD is 50 cm^2 find the value of t.



2. The area of the rectangle below is 36cm^2 what is the width of the rectangle



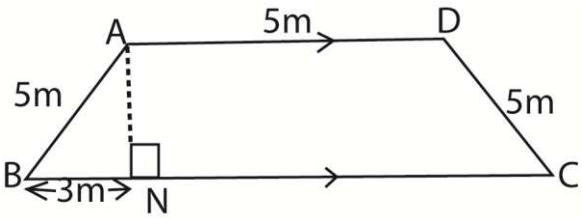
3. In the diagram below, BCDE is a trapezium. BC = 5 cm and CD = 10 cm. The area of the trapezium BCDE is 40cm^2.



(i) Calculate the area of triangle CDE.

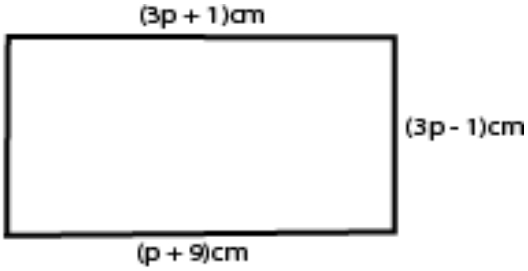
(ii) Find the length of BE.

4. Okodel built a house with a floor as shown in the diagram below. He covered the floor with a mat. The cost of the mat is sh. 5000 per square metre.

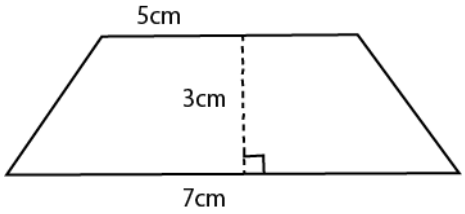


How much did Okodel spend to cover the whole floor?

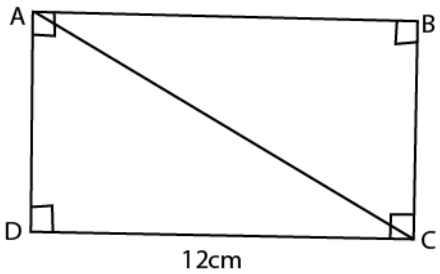
5. The figure below is that of rectangle. Use the information given to find the area of the rectangle.



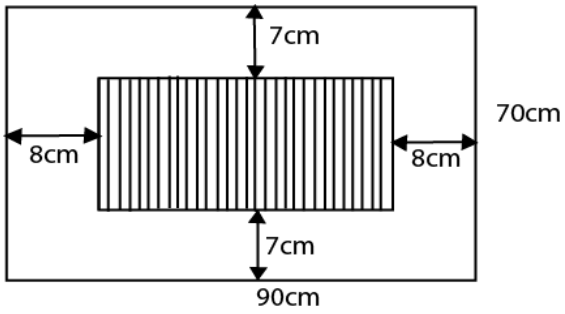
6. The figure below is a trapezium. Find its area.



7. If the area of the figure ABCD below is $60m^2$, find the length of its diagonal AC.



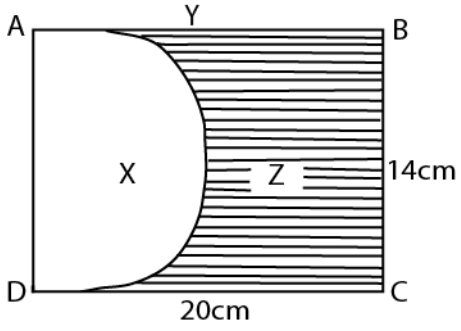
8. A piece of cloth is laid on a table 90cm long and 70cm wide as shown in the figure below. The area covered by the piece of cloth is shaded.



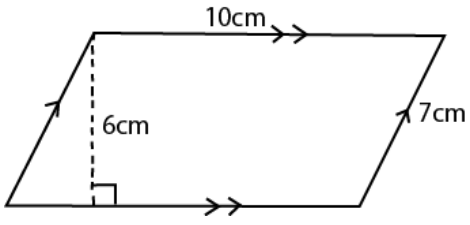
a) Find the length and width of the piece of cloth.

b). Find the area of the table that is not covered by the piece of cloth.

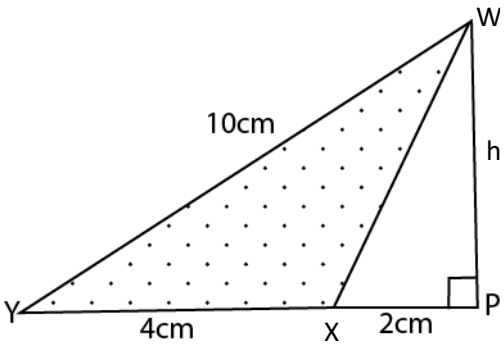
9. Find the area of the shaded part in the figure ABCD below. (Take $\pi = \frac{22}{7}$)



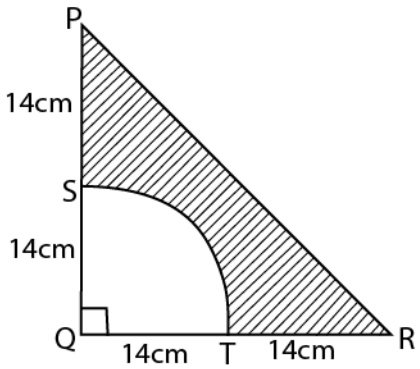
10. Find the area of the parallelogram drawn below:



11. In the figure below, find the area of the shaded triangle



12. In the figure below, PQ = QR = 28Cm. Use it to answer the questions that follows.



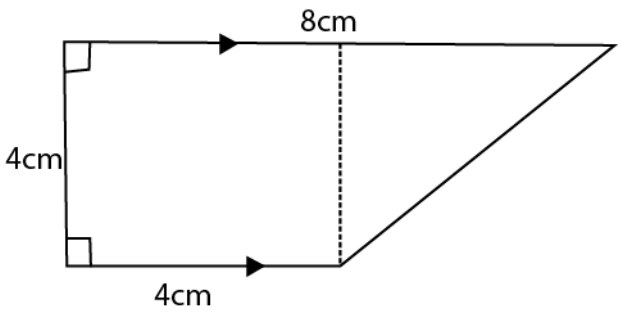
a) Find the area of triangle PQR.

b) Find the area of the sector QST. (T a k e $\pi = {}^{22}/_{7}$)

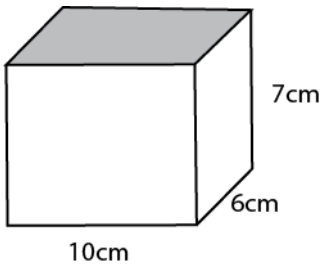
c) What is the area of the shaded part?

13. Find the area of circle whose radius is 7 cm. (Take $\pi=\frac{22}{7}$)

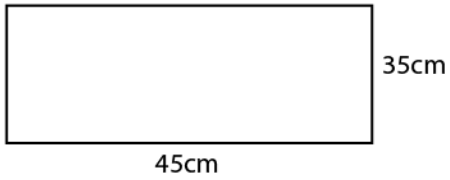
14. Find the area of the trapezium below.



15. Find the area of the shaded top cover of the rectangular box below:



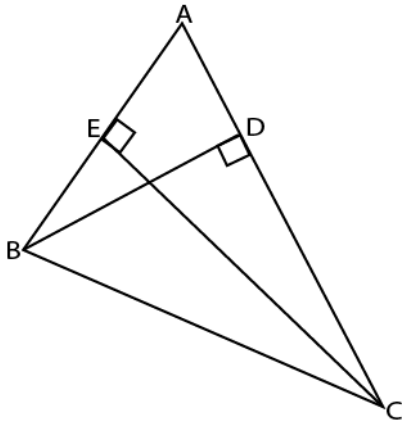
16. Abdul cut out circular plates of diameter 7cm from a rectangular sheet of metal of length 45 cm and width 35cm shown below.



(a) How many circular plates did he cut out from the rectangular sheet?

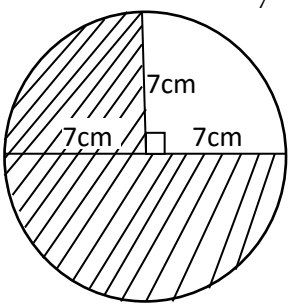
(b) Find the area of the unused sheet after cutting out the circular plates (Take $\pi = \frac{22}{7}$)

17. In the triangle below AB = 12cm, CE = 10cm and AC = 16cm. Use the triangle to find the length of DB



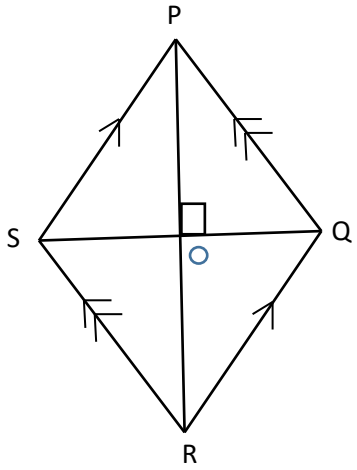
18. Find the area of the shaded part in the diagram below.

(Use $\pi=\frac{22}{7}$)



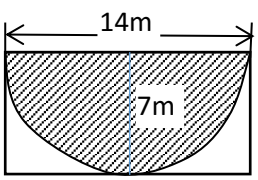
19. The diagram below is a rhombus *PQRS*. Its perimeter is 80cm. Diagonal *SQ* is 24 cm long.

(a) Find the length of diagonal *PR*



(b) Find the area of the rhombus in cm^2

20. The figure below shown a semi –circle enclosed in a rectangle .use it to answer the question that follow.



(a) Find the area of the rectangle (3 marks)

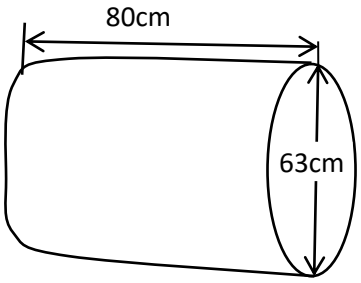
(b) Work out the area of the unshaded part. (3 marks)

21. The radius of a wheel of bicycle is 35cm. Find the circumference of the wheel.

(Take $\pi=\frac{22}{7}$)

22. The diagram below shows a metallic drum which was cut open to form a door sheet,

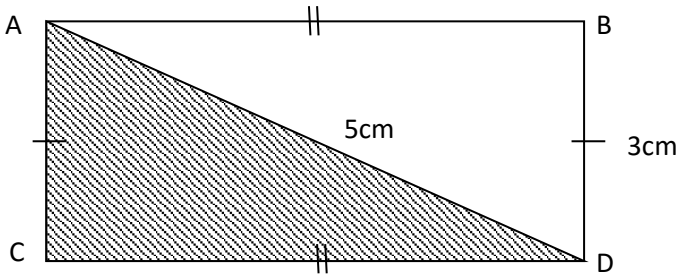
Use it to answer the question that follow.



(a) Find the length of the door which was made out of the sheet.
(Take $\pi=\frac{22}{7}$) (03 marks)

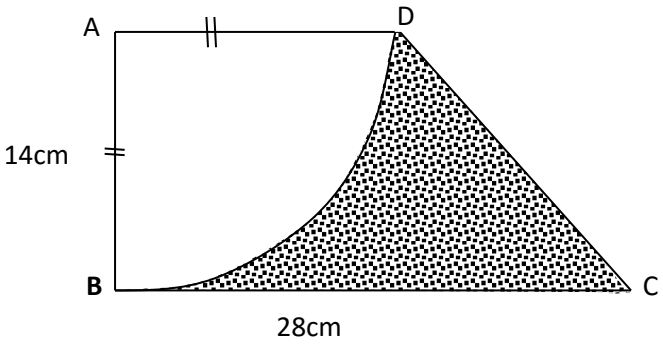
(b) Work out the area of the door in meters (03 marks)

23. Find the area of the shaded part in the figure below.



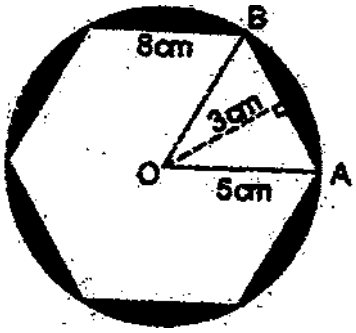
24. The figure below is a trapezium where AB=AD=14cm, BC = 28cm and ABD from a quarter of a circle.

Calculate the area of the shaded part (use $\pi = \frac{22}{7}$) (6mark)



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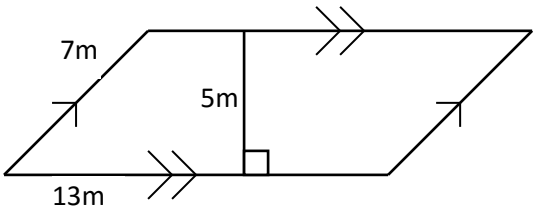
25. The figure below show a regular six- sided 8cm long enclosed in circle of radius 5cm. Triangle OAB of height 3cm is part of the polygon.



(a) Find the area of the polygon

(b) Find the area of the shaded region. (Use $\pi = 3.14$) (3mark)

26. Find the area of the figure below.



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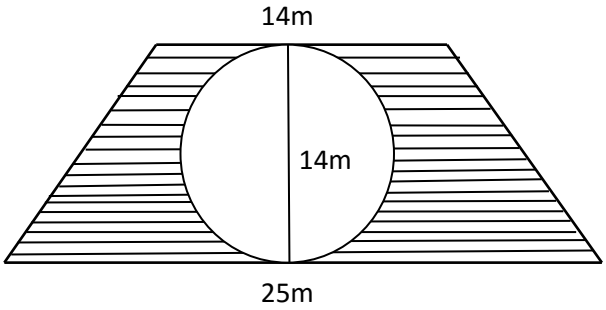
27. Square tiles of side = 20cm cm each were laid on the floor of a room measuring 600cm by 400cm.

a) Find the number of tiles needed to cover the floor. (03 marks)

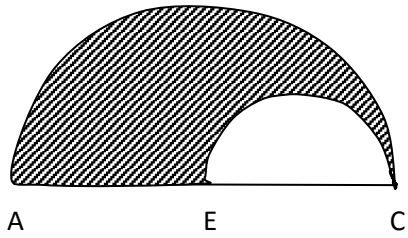
b) If a box containing 25 tiles costs 30,000, find the total cost of tiles needed to covered the whole floor.

28. Find the area of the shaded part in the diagram below.

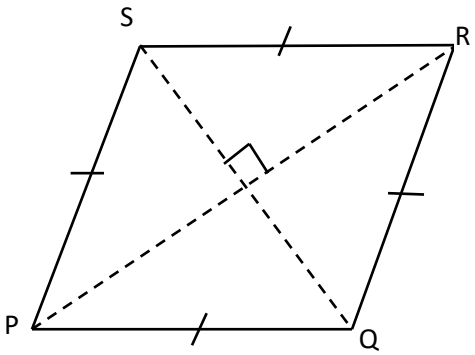
(Take π as $\frac{22}{7}$). (6marks)



29. In the diagram, AC =56 cm and EC is half of AC. Find the area of the shaded part. (take $\pi=\frac{22}{7}$)



30. The diagram below shows a rhombus PQRS. The diagonal PR= 24cm and QS= 10cm

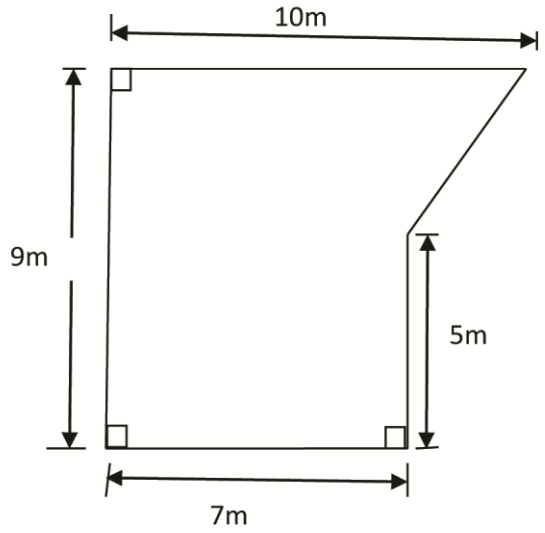


(a) Calculate the area of the rhombus (02marks)

(b) Find the perimeter of the rhombus (04 marks

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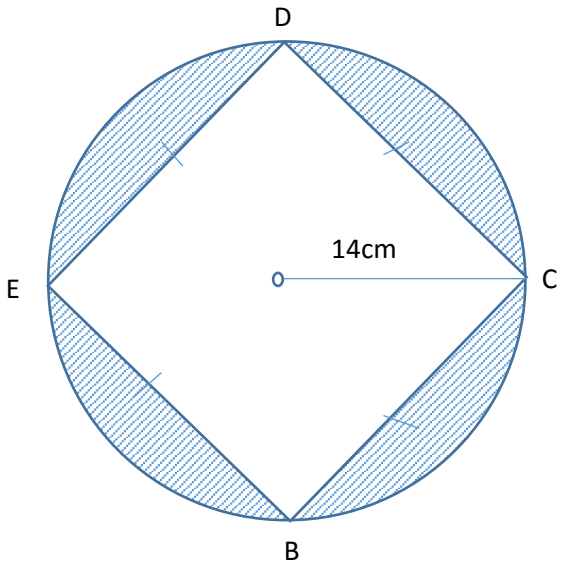
31. Study the figure below and use it to answer the questions that follow.



(a) Calculate the area of the figure (03mark)

(b) Work out the perimeter of the figure. (03marks)

32. The diagram bellow shows a square BCDE enclosed in a circle with center O and radius 14cm. Parts of the circle are shaded as shown. Study the diagram and use it to answer the questions that follow.

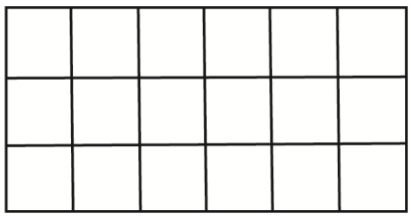


(a) Calculate the area of the circle. (Use $\pi = \frac{22}{7}$) (02marks)

(b) Find the area of the shaded part. (04 marks)

33. The area of a square flower garden is $196m^2$. Find the length of each side

34. The figure below represents a rectangular floor which is covered by square tiles of area $400cm^2$ each. Use it to answer the questions that follow.



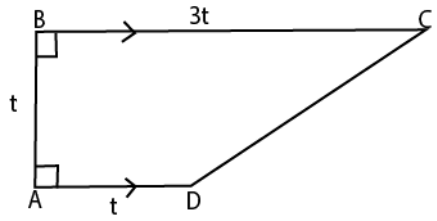
(a) Find the area of the rectangular floor. (02 marks)

(b) Calculate the perimeter of the rectangular floor (04 marks)

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Suggested answers

1. In the diagram below, ABCD: AD= t, BC=3t and AB = t. If the area of ABCD is 50 cm^2 find the value of t.



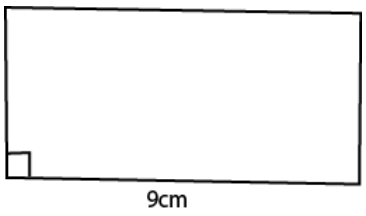
Area of trapezium = $\frac{1}{2}\ AB\ x\ (BC + AD)$

$50 = \frac{1}{2}\ t\ (t + 3t)$

$50 = 2t^2$

$t = 5$

2. The area of the rectangle below is 36cm^2 what is the width of the rectangle



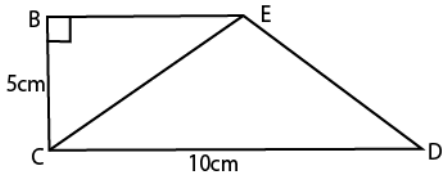
Area = length x width = 36cm^2

9 x width = 36 cm^2

Divide by 9 throughout

Width = 4cm

3. In the diagram below, BCDE is a trapezium. BC = 5 cm and CD = 10 cm. The area of the trapezium BCDE is 40cm^2.



(iii) Calculate the area of triangle CDE.

Area of the triangle CDE = $\frac{1}{2}\ x\ CD\ x\ CB$

$= \frac{1}{2}\ x\ 10\ x\ 5$

= 25cm^2

(iv) Find the length of BE.

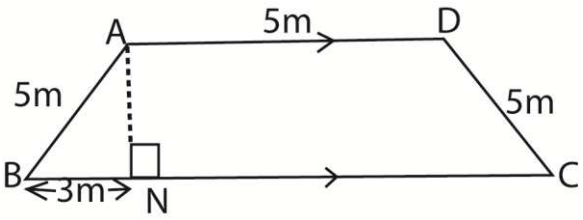
Area of the triangle BCE = $\frac{1}{2}\ x\ BE\ x\ CB$ = 40 -25

$= \frac{1}{2}\ x\ 5\ x\ BE$ = 15

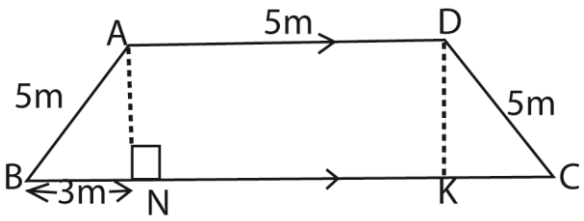
BE = $\frac{15\ x\ 2}{5}$

= 6cm

4. Okodel built a house with a floor as shown in the diagram below. He covered the floor with a mat. The cost of the mat is sh. 5000 per square metre.



How much did Okodel spend to cover the whole floor?



BN = KC = 3cm

BC = 3 + 5 + 3 = 11 cm

From Pythagoras theorem

$BN^2 + AN^2 = BA^2$

$3^2 + AN^2 = 5^2$

AN = $\sqrt{(25-9)}$ = $\sqrt{16}$ = 4cm

Area = $\frac{1}{2}\ AN(AD + BC)$

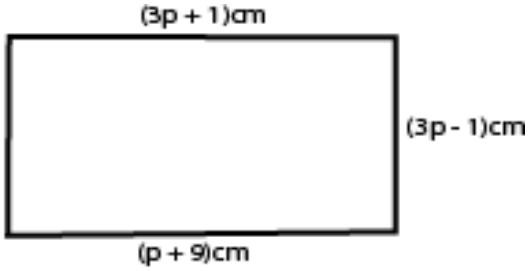
$= \frac{1}{2}\ x\ 4\ (5 + 11)$ = $32m^2$

$1m^2$ cost 5000

$32m^2$ cost 32 x 5000

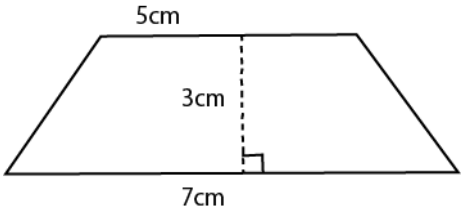
= shs 160000

5. The figure below is that of rectangle. Use the information given to find the area of the rectangle.



Value of p	Length = 3 x 4 + 1
(3p +1) = (p + 9)	= 13 cm
Collecting like terms	Width = 3 x4 -1
3p – p = 9 -1	= 11cm
2p = 8	Area = length x width
p = 4	13 x 11 = 143cm^2

6. The figure below is a trapezium. Find its area.

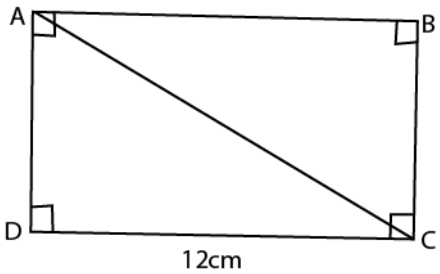


Area = $\frac{1}{2}h(a+b)$

$= \frac{1}{2}\ x\ 3\ (5+7)$

= 18cm^2

7. If the area of the figure ABCD below is 60m^2, find the length of its diagonal AC.



Area = L x W

60 = 12 x W

AD = W = 5cm

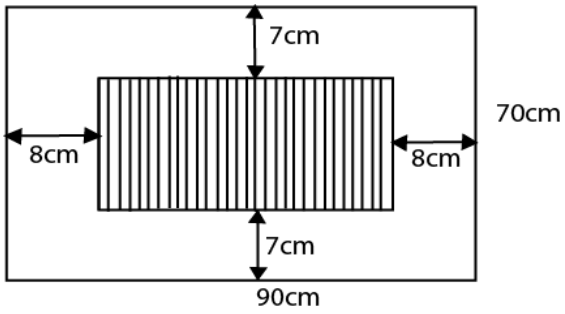
Using Pythagoras theorem

AC^2 = AD^2 + DC^2

AC^2 = 5^2 + 12^2 = 25 + 144 = 169

AC = $\sqrt{169}$ = 13

8. A piece of cloth is laid on a table 90cm long and 70cm wide as shown in the figure below. The area covered by the piece of cloth is shaded.



c) Find the length and width of the piece of cloth.

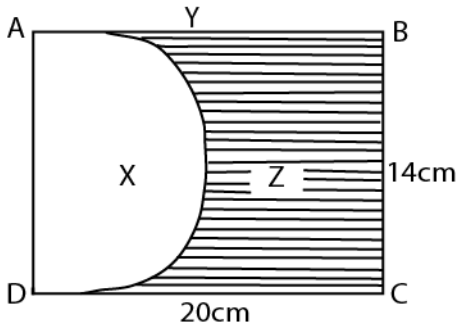
Width of piece of cloth =70 – (7 + 7) = 56cm

Length of piece of cloth = 90 – (8 + 8) = 74cm

b). Find the area of the table that is not covered by the piece of cloth.

Area of the table	= L x W = 90 x 70	= 6300 cm^2
Area of the cloth	= L x W = 74 x 56	= 4144 cm^2
Area uncovered (= difference)		= 2156 cm^2

9. Find the area of the shaded part in the figure ABCD below. (Take π =$\frac{22}{7}$)



Area of shaded part = area of rectangle – area of semicircle

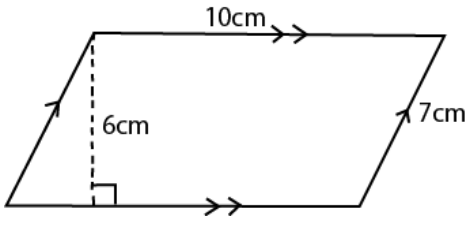
= (L x W) – ($\frac{1}{2}\pi r^2$)

= (20 x 14) – ($\frac{1}{2}$ x $\frac{22}{7}$ x $\frac{14}{2}$ $x \frac{14}{2}$)

= 280 -77

= 203cm^2

10. Find the area of the parallelogram drawn below:

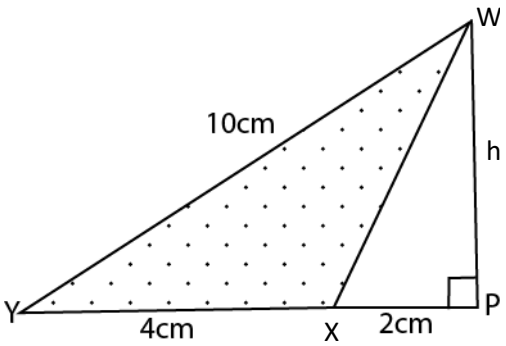


Area of parallelogram = L x h

= 10 x 6

= 60cm^2

11. In the figure below, find the area of the shaded triangle



Using Pythagoras theorem

$h^2 + (4+2)^2 = 10^2$

$h^2 + 36 = 100$

$h^2 = 100 - 36 = 64$

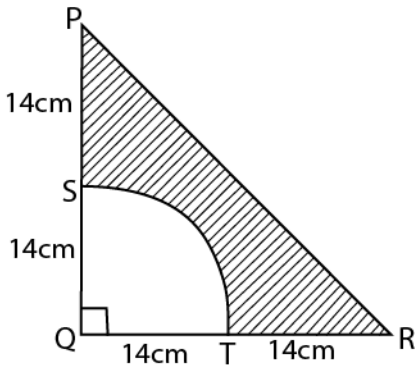
$h = \sqrt{64} = 8$

Area of shaded part = area of triangle YWP – area of the triangle WXP

$= \frac{1}{2}$ x (4+2) x 8 - $\frac{1}{2}$ x 2 x 8

= 24 – 8 = 16

12. In the figure below, PQ = QR = 28Cm. Use it to answer the questions that follows.



d) Find the area of triangle PQR.

Area of a triangle = $\frac{1}{2}bh$

$= \frac{1}{2}$ x 28 x 28

= 14 x 28

= 392cm^2

e) Find the area of the sector QST. (T a k e $\pi = {}^{22}/_{7}$)

Area of QRT = $\frac{1}{4}\ x\ \pi r^2$

$= \frac{1}{4}\ x\ \frac{22}{7}\ x\ 14\ x\ 14$

= 154cm^2

f) What is the area of the shaded part?

Area of shaded part = area of triangle – area of unshaded part

= 392 – 154

= 238 cm^2

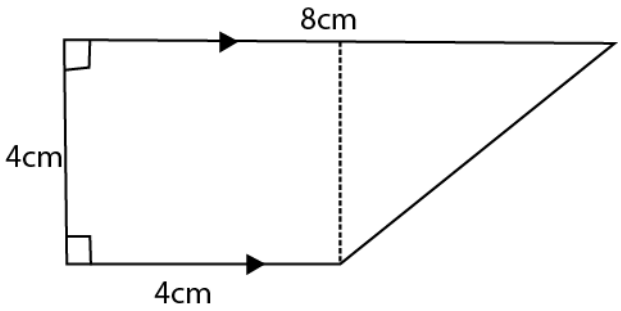
13. Find the area of circle whose radius is 7 cm. (Take $\pi = \frac{22}{7}$)

Area = πr^2

$= \frac{22}{7}\ x\ 7\ x\ 7$

= 154 cm^2

14. Find the area of the trapezium below.

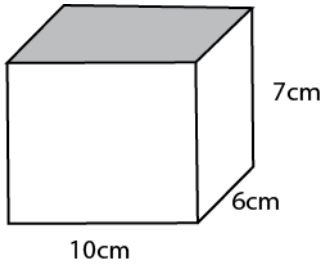


Area = $\frac{1}{2}h\ (a + b)$

$= \frac{1}{2}\ x\ 4\ (8 + 4)$

= 24cm^2

15. Find the area of the shaded top cover of the rectangular box below:

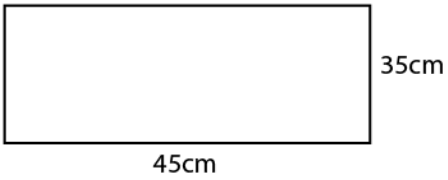


Area = L x W

= 10 x 6

= 60cm^3

16. Abdul cut out circular plates of diameter 7cm from a rectangular sheet of metal of length 45 cm and width 35cm shown below.



(c) How many circular plates did he cut out from the rectangular sheet?

He cut 6 x 5 = 30 circular plates

(d) Find the area of the unused sheet after cutting out the circular plates (Take π =$\frac{22}{7}$)

Area of the metal sheet = 45 x 35 = 1575cm^2

Area of a circular plate = $\pi r^2 = \frac{22}{7}\ x\ \frac{7}{2}\ x \frac{7}{2} = 38.5\ cm^2$

Area of 30 circular plate = 30 x 38.5 = 1155 cm^2

Area of unused part =1575-1155

= 420cm^2

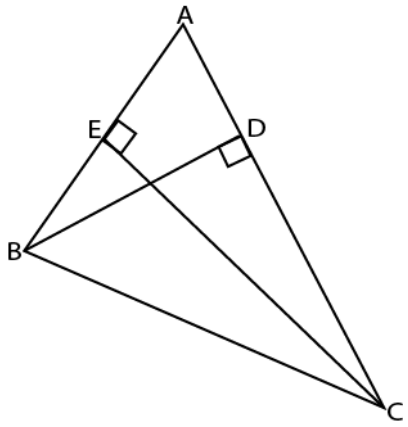
17. In the triangle below AB = 12cm, CE = 10cm and AC = 16cm. Use the triangle to find the length of DB

Answer

Area of triangle ABC = $\frac{1}{2}\ x\ AC\ x\ BD = \frac{1}{2}\ x\ AB\ x\ CE$

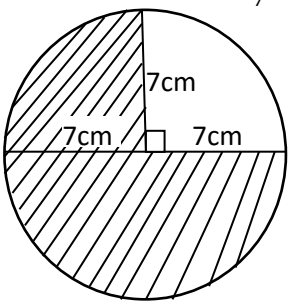
$= \frac{1}{2}\ x\ 16\ x\ BD = \frac{1}{2}\ x\ 12\ x\ 10$

BD = 7.5cm



18. Find the area of the shaded part in the diagram below.

(use π=$\frac{22}{7}$)



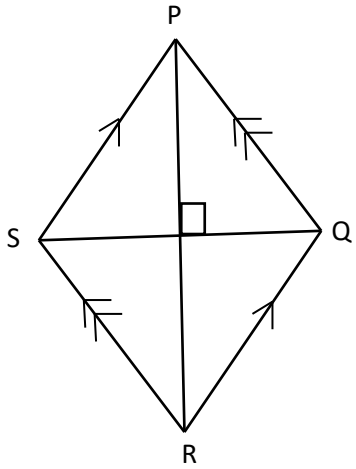
Area of shaded area = $\frac{3}{4}\pi r^2$

= $\frac{3}{4}\ x\ \frac{22}{7}\ x\ 7\ x7$

= 115.5cm^2

19. The diagram below is a rhombus *PQRS*. Its perimeter is 80cm. Diagonal *SQ* is 24 cm long.

(c) Find the length of diagonal *PR*



Side of rhombus = $\frac{80}{4} = 20$

OQ = $\frac{SQ}{2} = \frac{24}{2} = 12cm$

From Pythagoras theorem

PQ^2 = OQ^2 + OP^2

20^2 = 12^2 + OP^2

OP = $\sqrt{(400 - 144)}$

OP = 16

PR = 2OP = 2 x 16 = 32

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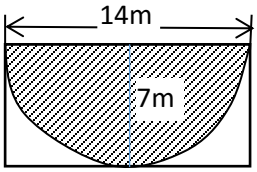
(d) Find the area of the rhombus in cm^2

Area of the rhombus = 2 x area of PSR

$= 2 \times \frac{1}{2} \times 24 \times 16$

$= 384\ cm^2$

20. The figure below shown a semi –circle enclosed in a rectangle .use it to answer the question that follow.



(c) Find the area of the rectangle (3 marks)

Area of a rectangle = L x W

= 14 x 7

$= 98m^2$

(d) Work out the area of the unshaded part. (3 marks)

Area of shaded semicircle = $\frac{1}{2}\pi r^2$

$= \frac{1}{2} \times \frac{22}{7} \times 7 \times 7$

$= 77m^2$

Area of unshaded part = Area of rectangle – Area of shaded semicircle

$= (98 - 77)m^2$

$= 21m^2$

21. The radius of a wheel of bicycle is 35cm. Find the circumference of the wheel.

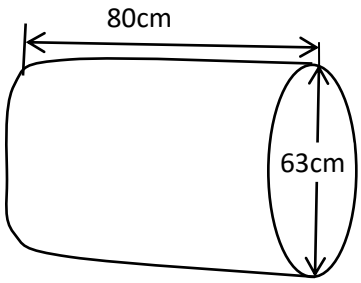
(Take $\pi = \frac{22}{7}$)

$C = 2\pi r = 2 \times \frac{22}{7} \times 35 = 220m$

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22. The diagram below shows a metallic drum which was cut open to form a door sheet,

Use it to answer the question that follow.



(c) Find the length of the door which was made out of the sheet.
(Take π=$\frac{22}{7}$) (03 marks)

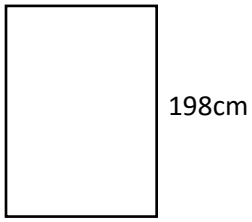
The length of the drum = circumference of the circle

= πD

= $\frac{22}{7}\ x\ 63$

= 198cm

(d) Work out the area of the door in meters (03 marks)

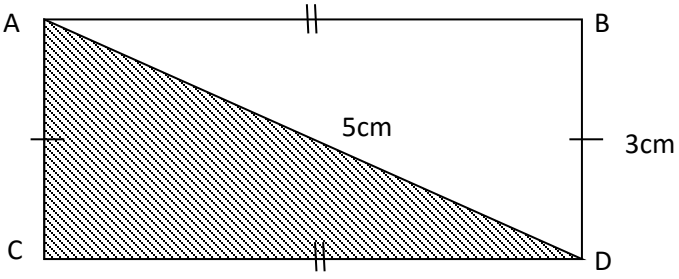


Area = L x W

= 80 x 198

= 15840cm^2

23. Find the area of the shaded part in the figure below.



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$AC^2 + CD^2 = AC^2$ (Pythagoras theorem)

$3^2 + CD^2 = 5^2$

$CD^2 = 25 - 9$

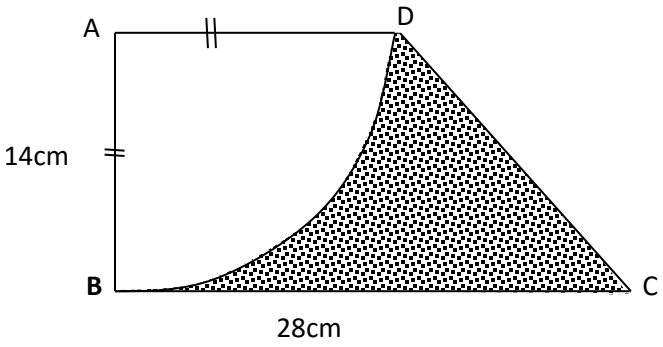
$= 16$

$CD = \sqrt{16} = 4cm$

Area $= \frac{1}{2}\ x\ AC\ x\ CD = \frac{1}{2}\ x\ 4\ x\ 3 = 2\ x\ 3 = 6cm^2$

24. The figure below is a trapezium where AB=AD=14cm, BC = 28cm and ABD from a quarter of a circle.

Calculate the area of the shaded part (use $\pi = \frac{22}{7}$) (6mark)

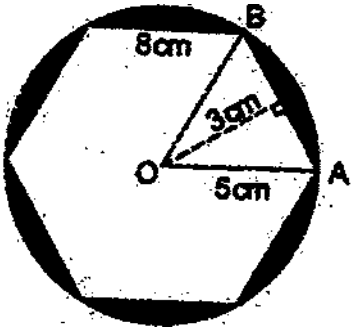


Area of shaded area = Area of ABCD – Area of ABD

$= \frac{1}{2}\ h\ (a + b) - \frac{1}{4}\ \pi r^2$

$= \frac{1}{2}\ x\ 14\ (14 + 28) - \frac{1}{4}\ \pi x\ 14^2 = 294 - 154 = 140\text{cm}^2$

25. The figure below show a regular six- sided 8cm long enclosed in circle of radius 5cm. Triangle OAB of height 3cm is part of the polygon.



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(a) Find the area of the polygon

Area of the polygon = area of AOB x 6

$$= \left(\frac{1}{2}\ x\ 8\ x\ 3\right) x\ 6 = 72cm^2$$

(b) Find the area of the shaded region. (Use $\pi = 3.14$) (3mark)

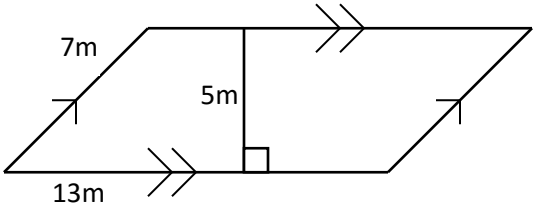
Area of shaded part = Area of circle – area of polygon

$$= \pi r^2 - 72$$

$$= \pi\ x\ 5^2 - 74 = 78.5 - 17$$

$$= 6.5\ cm^2$$

26. Find the area of the figure below.



The figure is a parallelogram

Area of parallel gram = base x perpendicular height

$= 13 \times 5$

$= 65m^2$

27. Square tiles of side = 20cm cm each were laid on the floor of a room measuring 600cm by 400cm.

a) Find the number of tiles needed to cover the floor. (03 marks)

Area of the floor = 600 x 400 = 240000cm^2

Area of a single tile = 20 x 20cm^2 = 400cm^2

400cm^2 are covered by 1tile

240000cm^2 are covered by $\frac{1\ x\ 240000}{400} = 600tile$

b) If a box containing 25 tiles costs 30,000, find the total cost of tiles needed to covered the whole floor.

Required to find the cost per tile then find the cost of 600tile

25 tile cost 30000

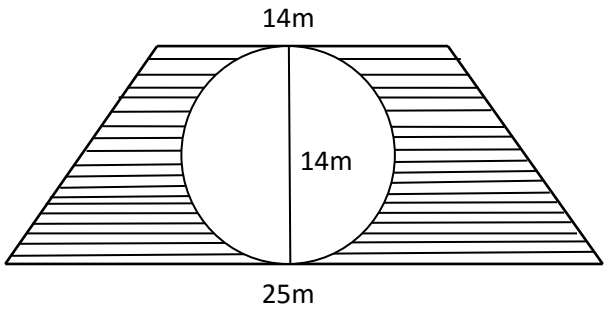
1tile costs $\frac{30000}{25} = 1200$

600 tiles cost 1200 x 600 = shs. 720000

Hence, 600 tiles cost shs. 720000

28. Find the area of the shaded part in the diagram below.

(Take π as $\frac{22}{7}$). (6marks)

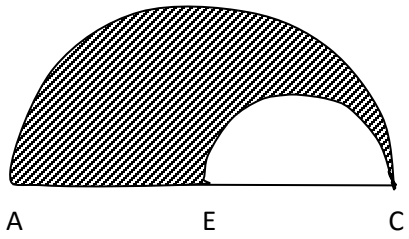


Area of circle = $\pi r^2 = \frac{22}{7}\ x\ \frac{14}{2}\ x\ \frac{14}{2} = 154cm^2$

Area of trapezium = $\frac{1}{2}\ h(a+b) = \frac{1}{2}\ x\ 14\ (14+25) = 273cm^2$

Shaded part = 273 – 154 =119cm^2.

29. In the diagram, AC =56 cm and EC is half of AC. Find the area of the shaded part. (take π=$\frac{22}{7}$)



Radius of big circle = $\frac{56}{2} = 28\ cm$

Area of big semi-cycle = $\frac{1}{2}\pi r^2 = \frac{22\ x\ 28\ x\ 28}{2\ x\ 7} = 1232\text{cm}^2$

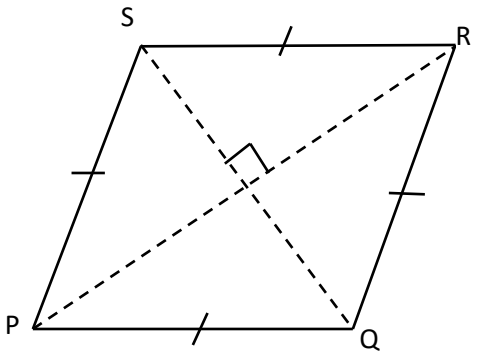
Radius of small semi-circle = $\frac{28}{2} = 14\ cm$

Area of small semi-cycle = $\frac{1}{2}\pi r^2 = \frac{22\ x\ 14\ x\ 14}{2\ x\ 7} = 308\text{cm}^2$

Area of shaded part = 1232 – 308 = 924 cm^2

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30. The diagram below shows a rhombus PQRS. The diagonal PR= 24cm and QS= 10cm



(c) Calculate the area of the rhombus (02marks)

Area = $\frac{1}{2}$ x d_1 x d_2 = $\frac{1}{2}$ x 24 x 10 = 120

Or Area = 4($\frac{1}{2}(b\ xh)$) = 4 x$\frac{1}{2}$ x 5 x 12 = $120cm^2$

(d) Find the perimeter of the rhombus (04 marks

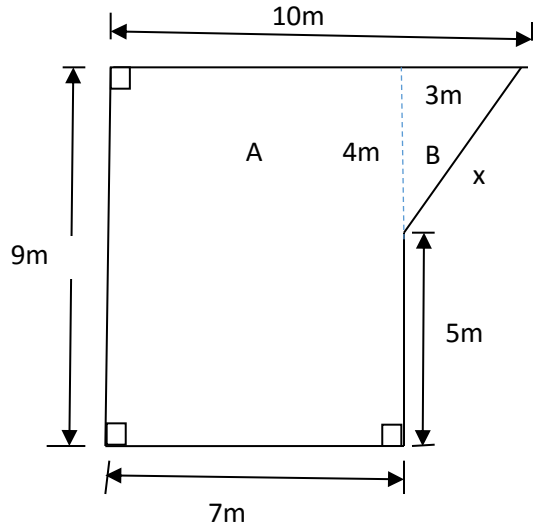
Applying Pythagoras theorem

(side)^2 = $5^2 + 12^2$ or side = $\sqrt{(5^2 + 12^2)}$ = 13

Perimeter of rhombus = 4 x side = 4 x 13 = 52

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31. Study the figure below and use it to answer the questions that follow.



(c) Calculate the area of the figure (03mark)

Total area = Area of A + Area of B

= L x B + ½ bh

= (7 x 9) + ½ (4 x 3)

= 63 + 6

= 69 cm^2

(d) Work out the perimeter of the figure. (03marks)

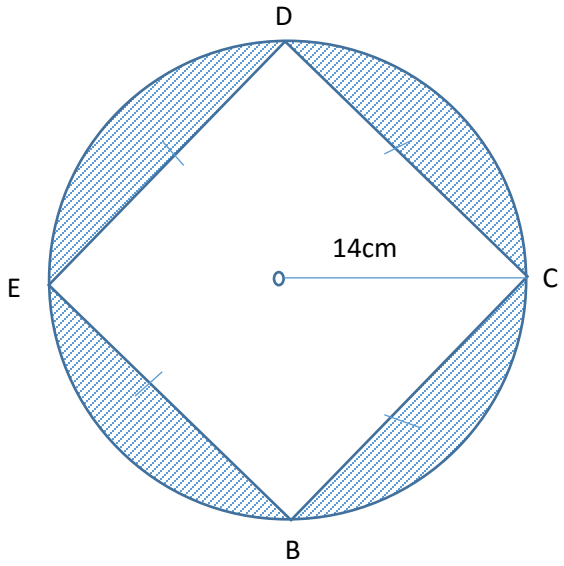
First, we find the value of X using Pythagoras theorem

X = $\sqrt{4^2 + 3^2} = 5m$

Perimeter = 10 + 5 + 5 + 7 + 9 = 36m

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32. The diagram bellow shows a square BCDE enclosed in a circle with center O and radius 14cm. Parts of the circle are shaded as shown. Study the diagram and use it to answer the questions that follow.



(c) Calculate the area of the circle. (Use π = $\frac{22}{7}$) (02marks)

Area = πr^2

= $\frac{22\ x\ 14\ x14}{7}$ = 616 cm^2

(d) Find the area of the shaded part. (04 marks)

$DC^2 = 14^2 \times 14^2$

DC = $\sqrt{(14^2\ x\ 14^2)}$ = 19.8cm

Area of unshaded part = $(DC)^2$

= 19.8^2

= 392 cm^2

Area of shaded part = (616 – 392)

= 224 cm^2

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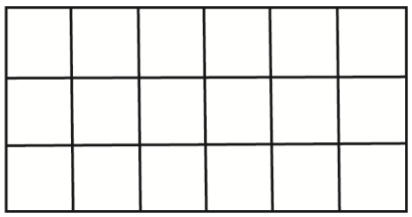
33. The area of a square flower garden is $196m^2$. Find the length of each side

Area of squares = a^2 (where a = length of 1 side)

$a^2 = 196m^2$

a = 14 m

34. The figure below represents a rectangular floor which is covered by square tiles of area $400cm^2$ each. Use it to answer the questions that follow.



(c) Find the area of the rectangular floor. (02 marks)

Area = area of 1 tile x number of tiles

= 400 x 6 x 3 = 7200 cm^2

(d) Calculate the perimeter of the rectangular floor (04 marks)

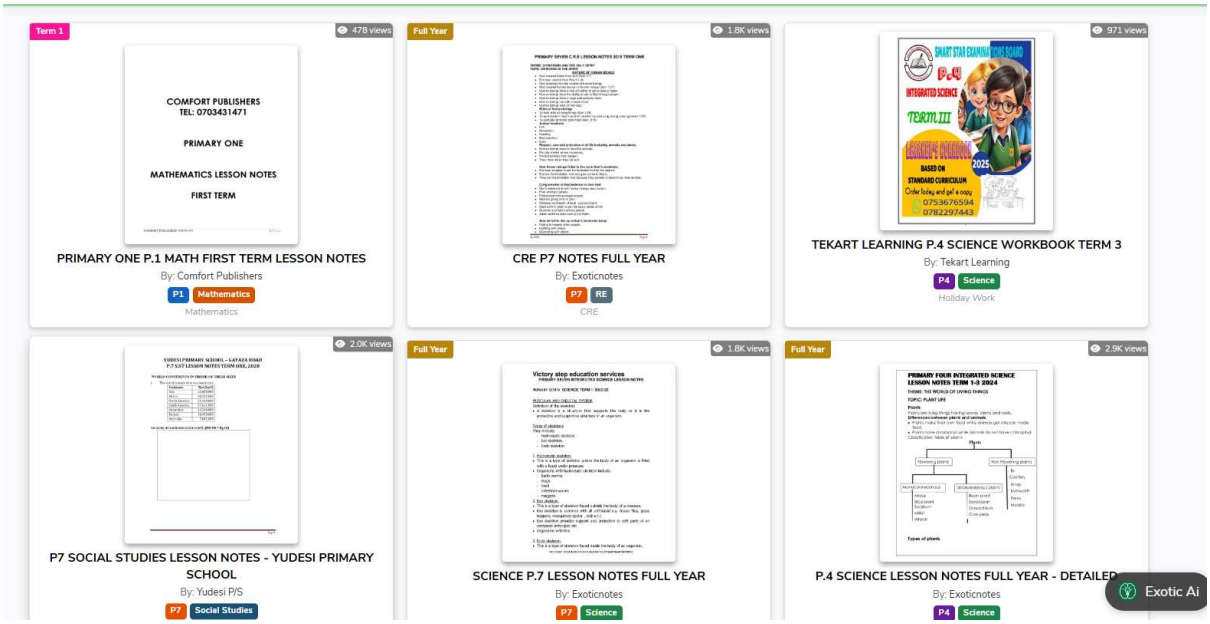
Length l of one side of a tile = $\sqrt{400}$ = 20cm

Perimeter is equal to the number of sides of tile around the figure x length of a side

18 x 20 = 360cm

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