CDS-AFCAT 1 2025

SSBCrack EXAMS

LIVE ●

MATHS

MENSURATION 2D

CLASS 4

NAVJYOTI SIR

30 Oct 2024 Live Classes Schedule

Time	Class	Instructor
8:00AM	30 OCTOBER 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	30 OCTOBER 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

NDA 1 2025 LIVE CLASSES

Time	Class	Instructor
11:30AM	GK - ANCIENT HISTORY - CLASS 1	RUBY MA'AM
1:00PM	CHEMISTRY - POLYMERS	SHIVANGI MA'AM
4:00PM	MATHS - ANALYTICAL GEOMETRY 3D - CLASS 3	NAVJYOTI SIR
5:30PM	ENGLISH - CLOZE TEST - CLASS 1	ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

Time	Class	Instructor
11:30AM	GK - ANCIENT HISTORY - CLASS 1	RUBY MA'AM
1:00PM	CHEMISTRY - POLYMERS	SHIVANGI MA'AM
5:30PM	ENGLISH - CLOZE TEST - CLASS 1	ANURADHA MA'AM
7:00PM	MATHS - MENSURATION 2D - CLASS 4	NAVJYOTI SIR

AFCAT 1 2025 LIVE CLASSES

| Time	Class	Instructor
4:00PM	STATIC GK - INTERNATIONAL DAYS, SUMMITS AND MEETING 2024	DIVYANSHU SIR
5:30PM	ENGLISH - CLOZE TEST - CLASS 1	ANURADHA MA'AM
7:00PM	MATHS - MENSURATION 2D - CLASS 4	NAVJYOTI SIR

Consider two identical rectangles ABCD and BEDF as shown in the figure given below. Let AB = 1 cm and BC = 2 cm.
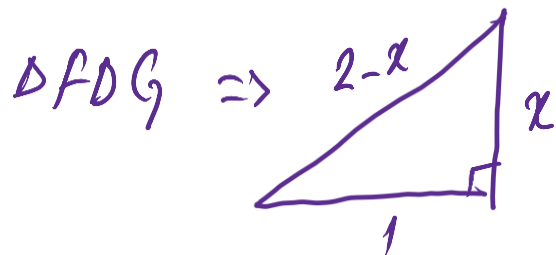
PYQ – 2024 – I

What is the area of the overlapping region ?

(a) $\dfrac{8}{5}$ square cm

(b) $\dfrac{5}{4}$ square cm ✓

(c) $\dfrac{4}{5}$ square cm

(d) $\dfrac{3}{4}$ square cm
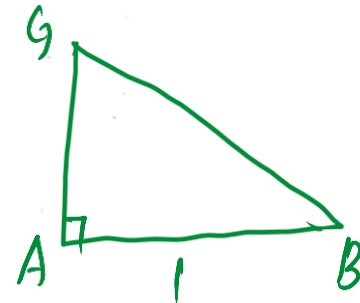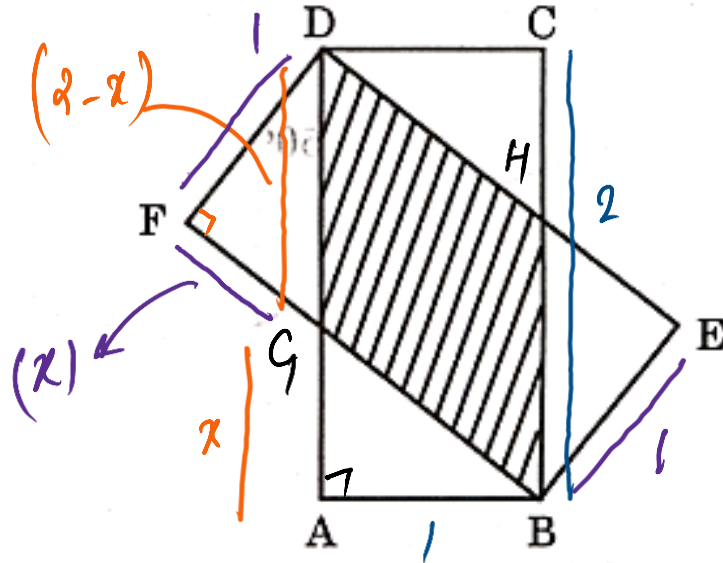
$ar\left(\text{overlapping region}\right) = ar\left(DGBH\right) = ar\left(ABCD\right) - 2\,ar\left(\text{right triangle}\right)$

$\Delta FDG \Rightarrow$

$(2-x)^2 = x^2 + 1^2$

$4 - 4x + x^2 = x^2 + 1$

$4x = 3$

$\left(x = \dfrac{3}{4}\right)$

$$= 2 \times 1 - 2 \times \frac{1}{2} \times 1 \times \frac{3}{4}$$

$$= 2 - \frac{3}{4} = \frac{5}{4}$$
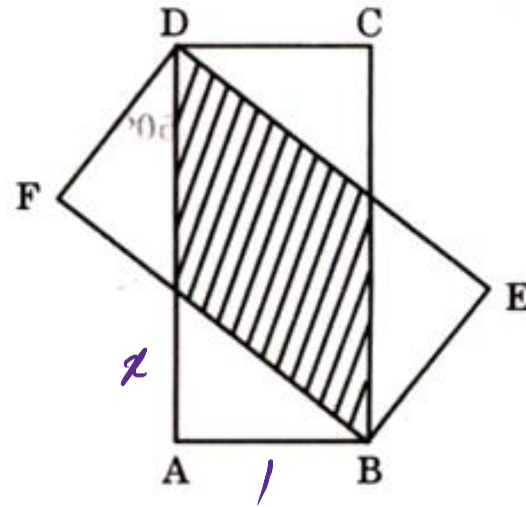
What is the area of the non-overlapping region ?

(a) $\dfrac{3}{4}$ square cm

(b) $\dfrac{11}{4}$ square cm

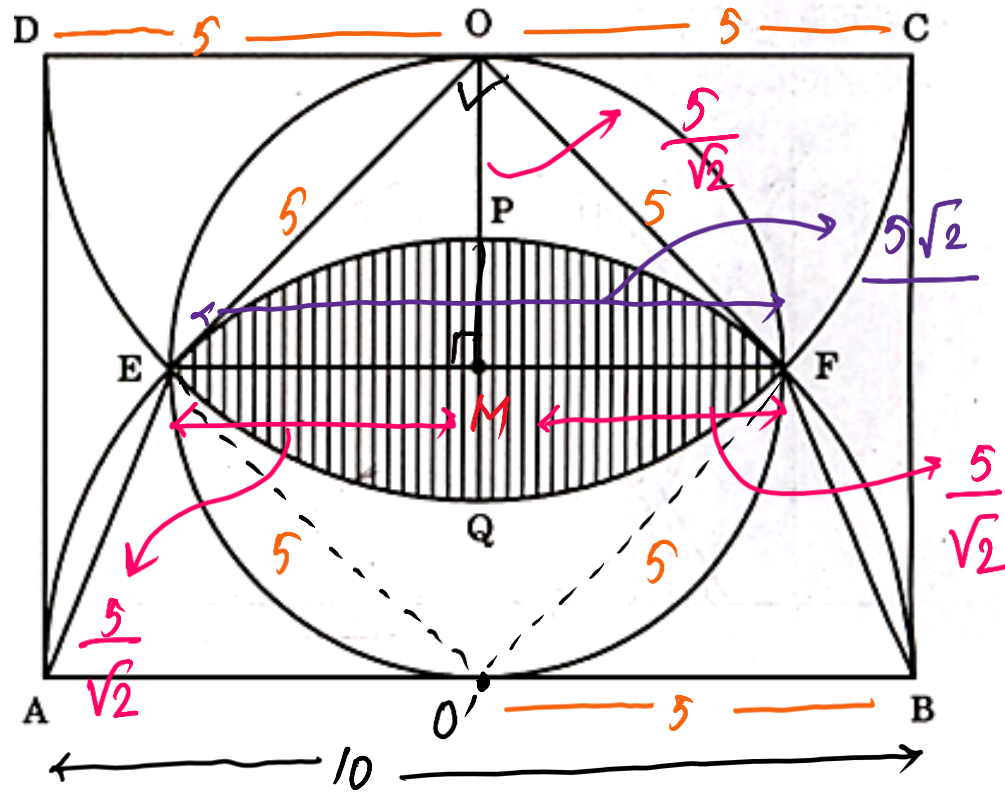(c) $\dfrac{3}{2}$ square cm ✓

(d) $\dfrac{5}{4}$ square cm

$$4x \left(\frac{1}{2} \times x \times 1 \right)$$

$$2 \times x \;=\; 2 \times \frac{3}{4} \;=\; \frac{3}{2} \; cm^2$$

Consider two identical semicircles and one circle inscribed in a rectangle of length 10 cm as shown in the figure given below.

(Take $\pi = 3.14$ and $\sqrt{2} = 1.4$).

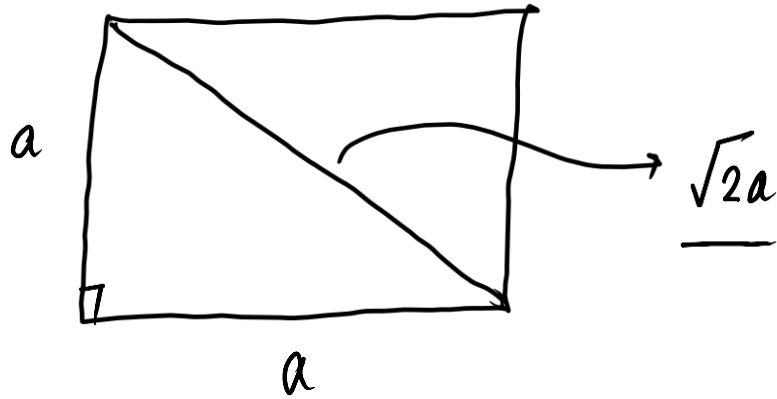**PYQ – 2024 – I**

What is the area of triangle EOF ?

(a) $12.5\sqrt{3}$ square cm

(b) $6.25\sqrt{3}$ square cm

(c) 12.5 square cm

(d) 6.25 square cm

DQC and APB are semi-circles.

$OEO'F$ is a circle $\longrightarrow$ EF is diameter,

$\angle EOF = 90°$

$EOFO'$ $\Big|$ one angle is $90°$ $\Big\}$ square
all sides is equal

$\sqrt{2}a$

In right triangle OEF,

$$EF = 5\sqrt{2}$$

$$\frac{1}{2} \times 5\sqrt{2} \times \frac{5}{\sqrt{2}} = \frac{25}{2} = 12.5 \, cm^2$$

(OR)

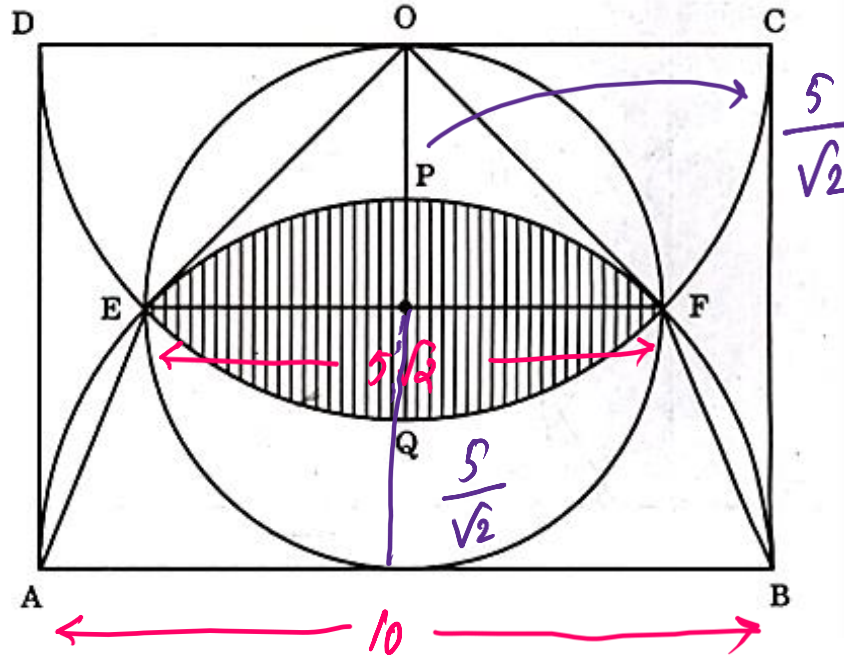$$ar(\triangle EOF) = \frac{ar(square)}{2} = \frac{5 \times 5}{2} = 12.5 \, cm^2$$

What is the area of trapezium AEFB ?

(a)   30 square cm ✓

(b)   25 square cm

(c)   20 square cm

(d)   18·75 square cm

PYQ – 2024 – I

$$\left(\frac{25}{2} \times \frac{24}{10} \right) = 30$$

$$\frac{25}{2} \left(1 + \sqrt{2} \right)$$

$$12.5 \times 2.4$$

$$ar\ (trapezium) = \frac{1}{2} \times \left(\frac{5}{\sqrt{2}} \right) \left[10 + 5\sqrt{2} \right]$$

$$= \frac{50}{2\sqrt{2}} + \frac{25}{2} = \frac{25}{\sqrt{2}} + \frac{25}{2} = \frac{25}{2} + \frac{25\sqrt{2}}{2}$$

What is the area of the shaded region ?

(a)   14·75 square cm

(b)   14·25 square cm ✓

(c)   7·225 square cm

(d)   7·625 square cm

PYQ – 2024 – I
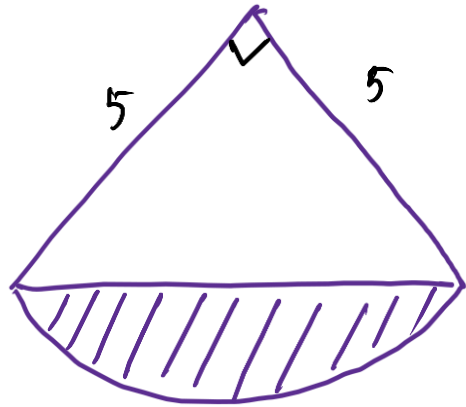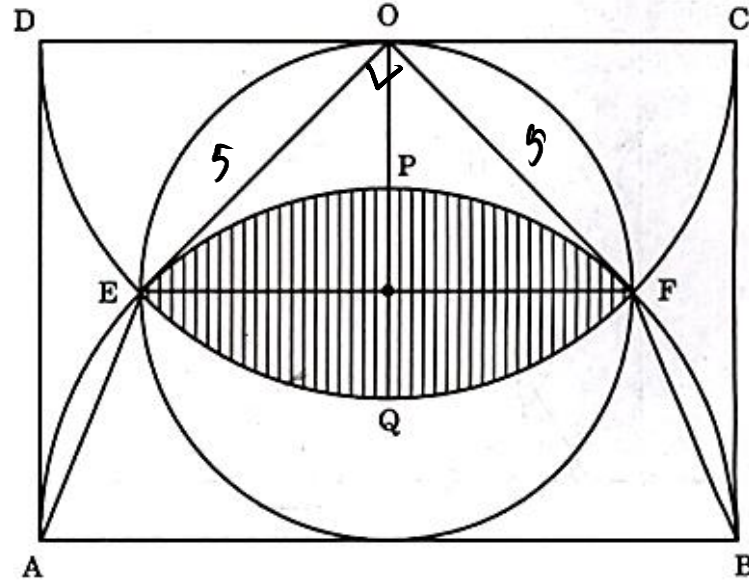
$$25\left(1.57-1\right)$$

$$25 \times 0.57$$

$$= 14.25$$

$$2 \times \left(\frac{90^{0}}{360^{0}} \times 3.14 \times (5)^{2} - 12.5\right)$$

$$2\left(\frac{25}{4} \times 3.14 - 12.5\right) = 2 \times \frac{25}{2}\left(\frac{3.14}{2} - 1\right)$$

Let ABCD be the diameter of a circle of radius 6 cm. The lengths AB, BC and CD are equal. Semi-circles are drawn with AB and BD as diameters as shown in the figure given below.
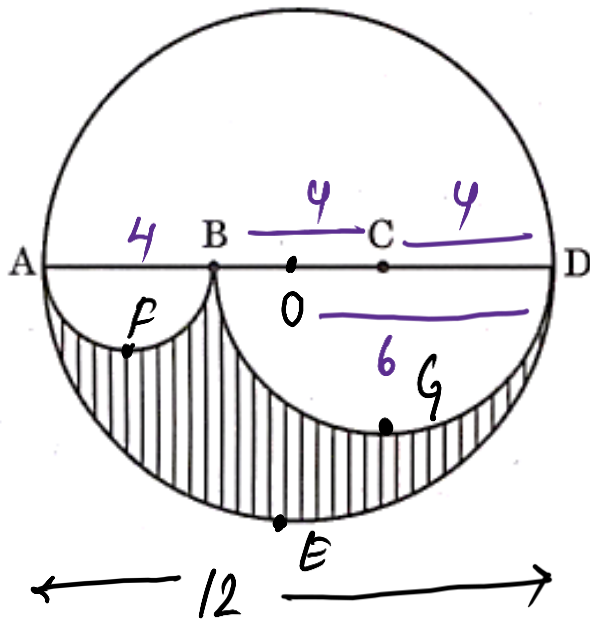
PYQ – 2024 – I

What is the ratio of the area of the shaded region to that of the non-shaded region ?

$$\frac{8\pi}{28\pi} = 2:7$$

(a) 2 : 7 ✓

shaded region

(b) 2 : 5

Semi circle (AED) − [ar (AFB) + ar (BGD)]

(c) 3 : 5

$$\frac{1}{2}\left(\pi(6)^2 - \left[\frac{1}{2}(\pi(2)^2) + \frac{1}{2}(\pi(4)^2) \right] \right)$$

(d) 5 : 8

$$\frac{1}{2}\left(36\pi - 4\pi - 16\pi \right)$$

$$= 8\pi ✓$$

non shaded = 36π − 8π = 28π

PYQ – 2024 – I
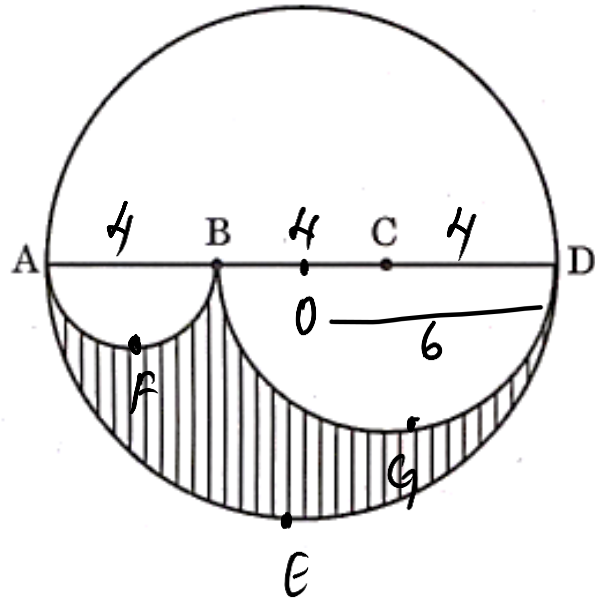
What is the perimeter of the shaded region ?

(a) 24π cm

$$arc\,(AFB) + ar\,(BGD) + arc\,(AED)$$

$$2\pi + 4\pi + 6\pi$$

(b) 18π cm

$$\underline{12\,\pi}$$

(c) 15π cm

(d) 12π cm ✓

Q) If the circumference of a circle is equal to the perimeter of square, then which one of the following is correct?

(a)   Area of circle = Area of square
(b)   Area of circle ≥ Area of square
(c)   Area of circle > Area of square ✓
(d)   Area of circle < Area of square

$$2\pi r \qquad\qquad 4a$$

$$\pi r = 2a$$

$$\frac{r}{a} = \frac{2}{\pi}$$

$$\frac{C}{S} = \frac{\pi r^2}{a^2} = \pi\left(\frac{2}{\pi}\right)^2$$

$$\frac{C}{S} = \left(\frac{4}{\pi}\right) \sim \frac{4}{3.14} > 1$$

$$\boxed{C > S}$$

Q) If the circumference of a circle is equal to the perimeter of square, then which one of the following is correct?

(a) Area of circle = Area of square
(b) Area of circle ≥ Area of square
(c) Area of circle > Area of square
(d) Area of circle < Area of square

Ans: (c)

Q) Consider the following statements
I.   Area of a segment of a circle is less than area of its corresponding sector. ✓
II.   Distance travelled by a circular wheel of diameter $2d$ cm in one revolution is greater than $6d$ cm.

Which of the above statements is/are correct?
(a)   Only I
(b)   Only II
(c)   Both I and II
(d)   Neither I nor II

radius $= d$

$$\frac{2\pi d \times 1}{\pi(2d) \times 1}$$

$$2\pi d = 6.28d > 6d$$

Q) Consider the following statements

I.   Area of a segment of a circle is less than area of its corresponding sector.

II.   Distance travelled by a circular wheel of diameter $2d$ cm in one revolution is greater than $6d$ cm.

Which of the above statements is/are correct?

(a)   Only I

(b)   Only II

(c)   Both I and II

(d)   Neither I nor II

Ans: (c)

Q) If the area of an equilateral triangle is x and its perimeter is y, then which one of the following is correct?

(a) $y^4 = 432x^2$ ✓

(b) $y^4 = 216x^2$

(c) $y^2 = 432x^2$

(d) None of these

a △ a

a

$3a$ ⟶ (y)

$\dfrac{\sqrt{3}}{4} a^2$ ⟶ (x)
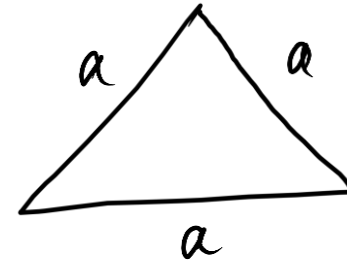
$81a^4$

$\dfrac{\cancel{432}^{}}{27} \times \dfrac{3}{\cancel{16}} a^4 = \underline{81a^4}$

Q) If the area of an equilateral triangle is x and its perimeter is y, then which one of the following is correct?

(a) $y^4 = 432x^2$

(b) $y^4 = 216x^2$

(c) $y^2 = 432x^2$

(d) None of these

Ans: (a)

Q) The area of an isosceles $\triangle ABC$ with $AB = AC$ and altitude $AD = 3$ cm is 12 sq cm. What is its perimeter?

(a) 18 cm

(b) 16 m

(c) 14 cm

(d) 12 cm

$$\frac{1}{2} \times BC \times 3 = 12$$

$$BC = 8$$

perimeter $= 8 + 5 + 5$

$$= \boxed{18}$$

Q) The area of an isosceles $\triangle ABC$ with $AB = AC$ and altitude $AD = 3$ cm is 12 sq cm. What is its perimeter?

(a)   18 cm
(b)   16 m
(c)   14 cm
(d)   12 cm

Ans: (a)
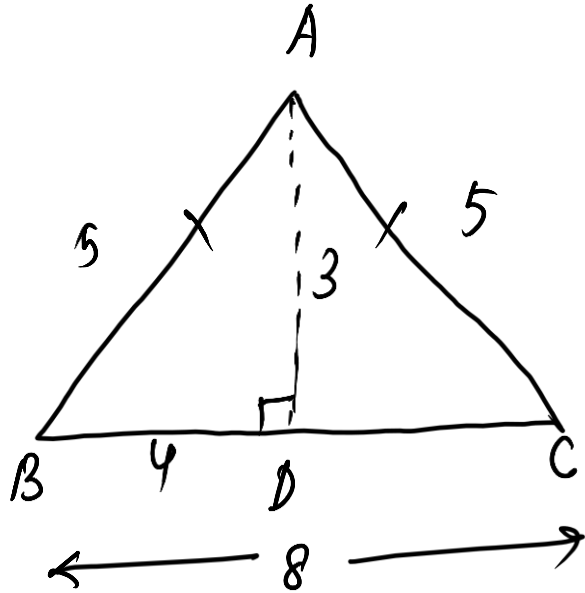
Q) What is the area between a square of side 10 cm and two inverted semi-circular, cross-sections each of radius 5 cm inscribed in the square?

(a)   17.5 cm²

(b)   18.5 cm²
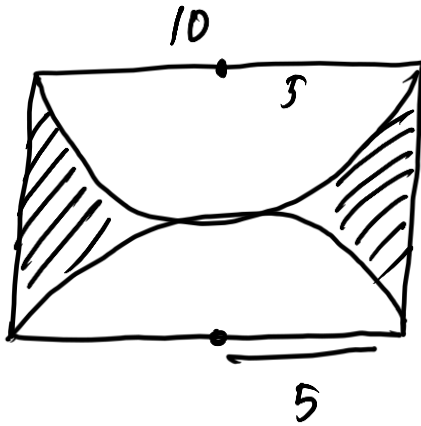
(c)   20.5 cm²

(d)   21.5 cm²

$$ar(square) - 2\ ar(semi\text{-}circle)$$

$$(10)^2 - \cancel{2}\left(\frac{\pi(5)^2}{\cancel{2}}\right)$$

$$100 - 25\pi$$

Q) What is the area between a square of side 10 cm and two inverted semi-circular, cross-sections each of radius 5 cm inscribed in the square?

(a) 17.5 cm²

(b) 18.5 cm²

(c) 20.5 cm²

(d) 21.5 cm²

Ans: (a)

Q) The area of a rectangular field is 144 m². If the length had
been 6 metres more, the area would have been 54 m² more.
The original length of the field is

(a) 22 metres   (b) 18 metres

(c) 16 metres   (d) 24 metres

l

b
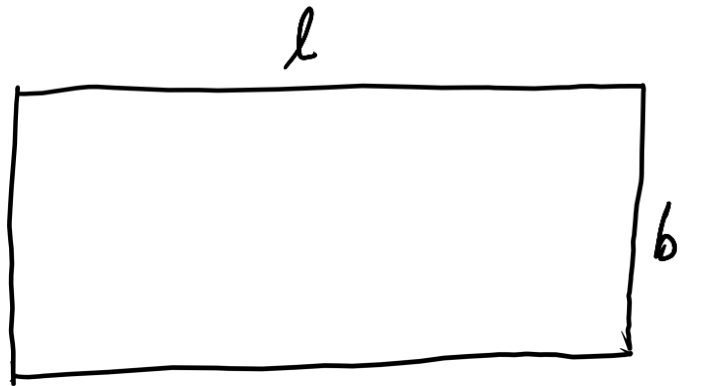
$$lb = 144 \longrightarrow ①$$

$$(l+6)(b) = 198 \longrightarrow ②$$

$$144 + 6b = 198$$

$$6b = 54 \Rightarrow \underline{b = 9}$$

$$l = \frac{144}{9} = \underline{16}$$

Q) The area of a rectangular field is 144 m^2. If the length had been 6 metres more, the area would have been 54 m^2 more. The original length of the field is

(a)   22 metres   (b)   18 metres
(c)   16 metres   (d)   24 metres

Ans: (c)

Q) A rectangular paper, when folded into two congruent parts had a perimeter of 34 cm for each part folded along one set of sides and the same is 38 cm when folded along the other set of sides. What is the area of the paper?

(a) $140 \, cm^2$

(b) $240 \, cm^2$

(c) $560 \, cm^2$

(d) None of these

Q) A rectangular paper, when folded into two congruent parts had a perimeter of 34 cm for each part folded along one set of sides and the same is 38 cm when folded along the other set of sides. What is the area of the paper?

(a) $140\ cm^2$

(b) $240\ cm^2$

(c) $560\ cm^2$

(d) None of these

Ans: (a)

Q) The length and breadth of the floor of the room are 20 feet and 10 feet respectively. Square tiles of 2 feet length of different colours are to be laid on the floor. Black tiles are laid in the first row on all sides. If white tiles are laid in the one-third of the remaining and blue tiles in the rest, how many blue tiles will be there?

(a) 16   (b) 24   (c) 32   (d) 48

Q) The length and breadth of the floor of the room are 20 feet and 10 feet respectively. Square tiles of 2 feet length of different colours are to be laid on the floor. Black tiles are laid in the first row on all sides. If white tiles are laid in the one-third of the remaining and blue tiles in the rest, how many blue tiles will be there?

(a) 16   (b) 24   (c) 32   (d) 48

Ans: (a)

Q) Four equal circles are described about the four corners of a square so that each touches two of the others. If a side of the square is 14 cm, then the area enclosed between the circumferences of the circles is :

(a) 24 cm^2 (b) 42 cm^2
(c) 154 cm^2 (d) 196 cm^2

Q) Four equal circles are described about the four corners of a square so that each touches two of the others. If a side of the square is 14 cm, then the area enclosed between the circumferences of the circles is :

(a) 24 cm^2
(b) 42 cm^2
(c) 154 cm^2
(d) 196 cm^2

Ans: (b)

Q) Wheels of diameters 7 cm and 14 cm start rolling simultaneously from X and Y, which are 1980 cm apart, towards each other in opposite directions. Both of them make the same number of revolutions per second. If both of them meet after 10 seconds, the speed of the smaller wheel is:

(a)   22 cm / sec   (b)   44 cm / sec
(c)   66 cm / sec   (d)   132 cm / sec

Q) Wheels of diameters 7 cm and 14 cm start rolling simultaneously from X and Y, which are 1980 cm apart, towards each other in opposite directions. Both of them make the same number of revolutions per second. If both of them meet after 10 seconds, the speed of the smaller wheel is:

(a)   22 cm / sec
(b)   44 cm / sec
(c)   66 cm / sec
(d)   132 cm / sec

Ans: (a)

Q) What is the total area of three equilateral triangles inscribed in a semi-circle of radius 2 cm?

(a) 12 cm^2

(b) $\dfrac{3\sqrt{3}}{4} \text{ cm}^2$

(c) $\dfrac{9\sqrt{3}}{4} \text{ cm}^2$

(d) $3\sqrt{3} \text{ cm}^2$

Q) What is the total area of three equilateral triangles inscribed in a semi-circle of radius 2 cm?

(a) $12 \, \text{cm}^2$

(b) $\dfrac{3\sqrt{3}}{4} \, \text{cm}^2$

(c) $\dfrac{9\sqrt{3}}{4} \, \text{cm}^2$

(d) $3\sqrt{3} \, \text{cm}^2$

Ans: (d)

Q) A square and an equilateral triangle have equal perimeter. If the diagonal of the square is $12\sqrt{2}$ cm, then the area of the triangle is

(a) $24\sqrt{2}$ cm^2

(b) $24\sqrt{3}$ cm^2

(c) $48\sqrt{3}$ cm^2

(d) $64\sqrt{3}$ cm^2

Q) A square and an equilateral triangle have equal perimeter. If the diagonal of the square is $12\sqrt{2}$ cm, then the area of the triangle is

(a) $24\sqrt{2}$ cm^2

(b) $24\sqrt{3}$ cm^2

(c) $48\sqrt{3}$ cm^2

(d) $64\sqrt{3}$ cm^2

Ans: (d)

Q) The product of the lengths of the diagonals of a square is 50 square units. What is the length of a side of the square?

(a) $5\sqrt{2}$ units

(b) 5 units

(c) 10 units

(d) $2\sqrt{5}$ units

Q) The product of the lengths of the diagonals of a square is 50 square units. What is the length of a side of the square?
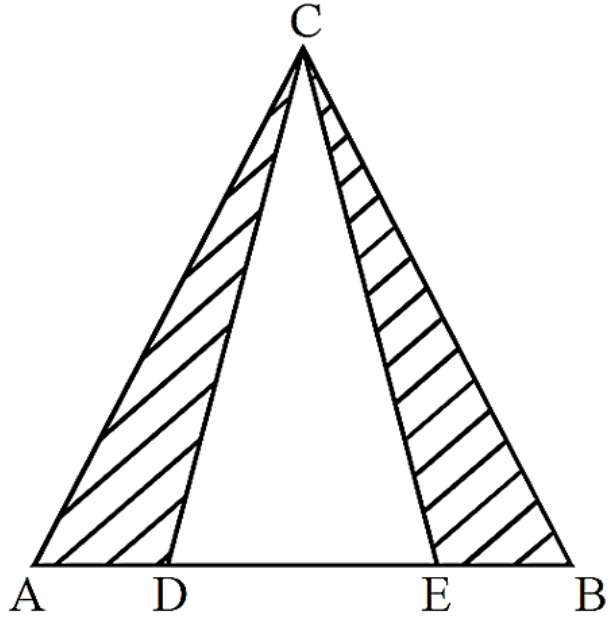
(a) $5\sqrt{2}$ units

(b) 5 units

(c) 10 units

(d) $2\sqrt{5}$ units

Ans: (b)

Q) In the equilateral triangle ABC, $AD = DE = BE$, D and E lies on the AB. If each side of the triangle (i.e., AB, BC and AC) be 6 cm, then the area of the shaded region is:

(a) 9 cm^2

(b) $6\sqrt{3} \text{ cm}^2$

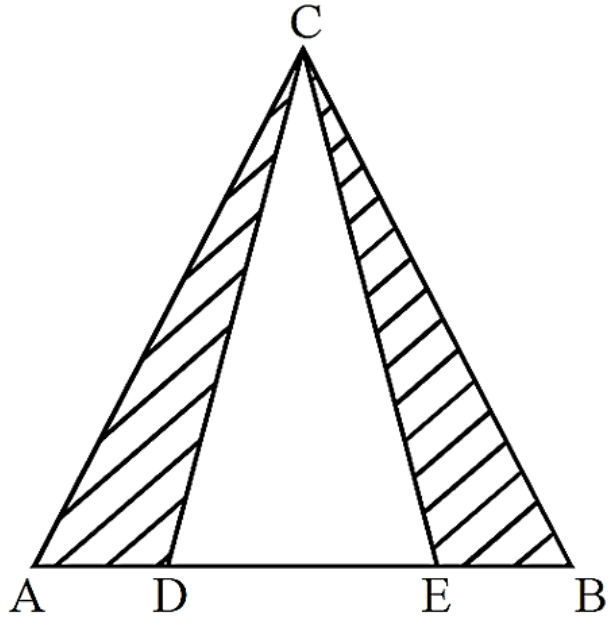(c) $5\sqrt{3} \text{ cm}^2$

(d)   None of these

Q) In the equilateral triangle ABC, $AD = DE = BE$, D and E lies on the AB. If each side of the triangle (i.e., AB, BC and AC) be 6 cm, then the area of the shaded region is:

(a) $9 \, cm^2$

(b) $6\sqrt{3} \, cm^2$

(c) $5\sqrt{3} \, cm^2$

(d) None of these

Ans: (b)

Q) A horse is tethered to one corner of a rectangular grassy field 40 m by 24 m with a rope 14 m long. Over how much area of the field can it graze?

(a) 154 cm^2
(b) 308 m^2
(c) 150 m^2
(d) None of these

Q) A horse is tethered to one corner of a rectangular grassy field 40 m by 24 m with a rope 14 m long. Over how much area of the field can it graze?

(a) $154 \, cm^2$

(b) $308 \, m^2$

(c) $150 \, m^2$

(d) None of these

Ans: (a)

Q) A garden is 24 m long and 14 m wide. There is a path 1 m wide outside the garden along its sides. If the path is to be constructed with square marble tiles 20 cm × 20 cm, the number of tiles required to cover the path is

(a) 1800   (b) 200   (c) 2000   (d) 2150

Q) A garden is 24 m long and 14 m wide. There is a path 1 m wide outside the garden along its sides. If the path is to be constructed with square marble tiles 20 cm × 20 cm, the number of tiles required to cover the path is

(a)   1800   (b)   200   (c)   2000   (d)   2150

Ans: (c)

Q) In the figure given below, the area of rectangle ABCD is 100 sq cm. O is any point on AB and CD = 20 cm. Then, the area of $\triangle$COD is
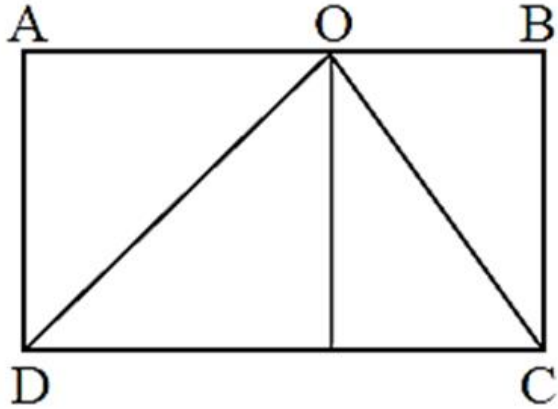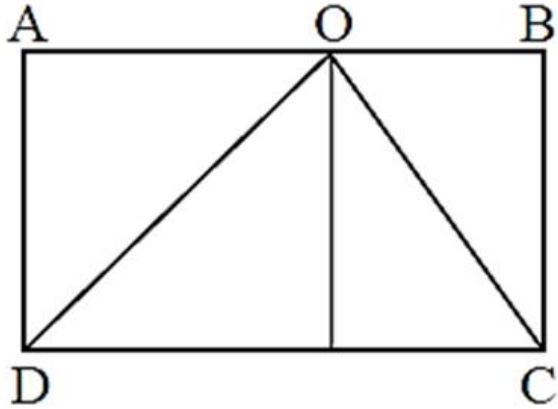

(a)   40 sq cm

(b)   45 sq cm

(c)   50 sq cm

(d)   80 sq cm

Q) In the figure given below, the area of rectangle ABCD is 100 sq cm. O is any point on AB and CD = 20 cm. Then, the area of △COD is

(a)   40 sq cm   (b)   45 sq cm
(c)   50 sq cm   (d)   80 sq cm

Ans: (c)

Q) The arc AB of the circle with centre at O and radius 10 cm has length 16 cm. What is the area of the sector bounded by the radii OA, OB and the arc AB?

(a) 40π sq cm

(b)   40 sq cm

(c)   80 sq cm

(d) 20π sq cm

Q) The arc AB of the circle with centre at O and radius 10 cm has length 16 cm. What is the area of the sector bounded by the radii OA, OB and the arc AB?

(a) 40π sq cm   (b)   40 sq cm

(c)   80 sq cm   (d) 20π sq cm

Ans: (c)

Q) If the area of a regular hexagon is $96\sqrt{3}$ sq cm, then its perimeter is

(a) 36 cm   (b) 48 cm
(c) 54 cm   (d) 64 cm

Q) If the area of a regular hexagon is $96\sqrt{3}$ sq cm, then its perimeter is

(a) 36 cm

(b) 48 cm

(c) 54 cm

(d) 64 cm

Ans: (b)

Q) Three congruent circles each of radius 4 cm touch one another. What is the area (in cm²) of the portion included between them?

(a) 8π

(b) $16\sqrt{3} - 8\pi$

(c) $16\sqrt{3} - 4\pi$

(d) $16\sqrt{3} - 2\pi$

Q) Three congruent circles each of radius 4 cm touch one another. What is the area (in cm²) of the portion included between them?

(a) 8π

(b) $16\sqrt{3} - 8\pi$

(c) $16\sqrt{3} - 4\pi$

(d) $16\sqrt{3} - 2\pi$

Ans: (b)

Q) The two diagonals of a rhombus of lengths 55 cm and 48 cm. If p is the perpendicular height of the rhombus, then which one of the following is correct?

(a) $36\,\text{cm} < p < 37\,\text{cm}$

(b) $35\,\text{cm} < p < 36\,\text{cm}$

(c) $34\,\text{cm} < p < 35\,\text{cm}$

(d) $33\,\text{cm} < p < 34\,\text{cm}$

Q) The two diagonals of a rhombus of lengths 55 cm and 48 cm. If p is the perpendicular height of the rhombus, then which one of the following is correct?
(a) $36\,cm < p < 37\,cm$ (b) $35\,cm < p < 36\,cm$
(c) $34\,cm < p < 35\,cm$ (d) $33\,cm < p < 34\,cm$

Ans: (a)

Q) The lengths of two sides of a right angled triangle which contain the right angle are a and b, respectively. Three squares are drawn on the three sides of the triangle on the outer side. What is the total area of the triangle and the three squares?

(a) $2(a^2 + b^2) + ab$

(b) $2(a^2 + b^2) + 2.5\,ab$

(c) $2(a^2 + b^2) + 0.5ab$

(d) $2.5(a^2 + b^2)$

Q) The lengths of two sides of a right angled triangle which contain the right angle are a and b, respectively. Three squares are drawn on the three sides of the triangle on the outer side. What is the total area of the triangle and the three squares?

(a) $2(a^2 + b^2) + ab$

(b) $2(a^2 + b^2) + 2.5\,ab$

(c) $2(a^2 + b^2) + 0.5ab$

(d) $2.5(a^2 + b^2)$

Ans: (c)