CDS-AFCAT 1 2025

SSBCrack EXAMS

LIVE

MATHS

MENSURATION 2D - 1

MCQS

NAVJYOTI SIR

05 Feb 2025 Live Classes Schedule

9:00AM	05 FEBRUARY 2025 DAILY DEFENCE UPDATES	DIVYANSHU SIR

SSB INTERVIEW LIVE CLASSES

9:30AM	OVERVIEW OF GD & LECTURETTE	ANURADHA MA'AM

AFCAT 1 2025 LIVE CLASSES

3:00PM	STATIC GK - RAMSAR & LAKES IN INDIA	DIVYANSHU SIR
4:30PM	ENGLISH - IDIOMS & PHRASES - CLASS 2	ANURADHA MA'AM
5:30PM	MATHS - MENSURATION 2D - CLASS 1	NAVJYOTI SIR

NDA 1 2025 LIVE CLASSES

10:00AM	MATHS - BINOMIAL THEOREM	NAVJYOTI SIR
1:00PM	PHYSICS - MAGNETIC EFFECTS OF ELECTRIC CURRENT	NAVJYOTI SIR
4:30PM	ENGLISH - IDIOMS & PHRASES - CLASS 2	ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

1:00PM	PHYSICS - MAGNETIC EFFECTS OF ELECTRIC CURRENT	NAVJYOTI SIR
4:30PM	ENGLISH - IDIOMS & PHRASES - CLASS 2	ANURADHA MA'AM
5:30PM	MATHS - MENSURATION 2D - CLASS 1	NAVJYOTI SIR

PYQ – 2024 - II

Let MN be a chord of length 16 cm of a circle with centre at O and radius 10 cm. The tangents at M and N intersect at a point P. Further, OP intersects MN perpendicularly at Q.

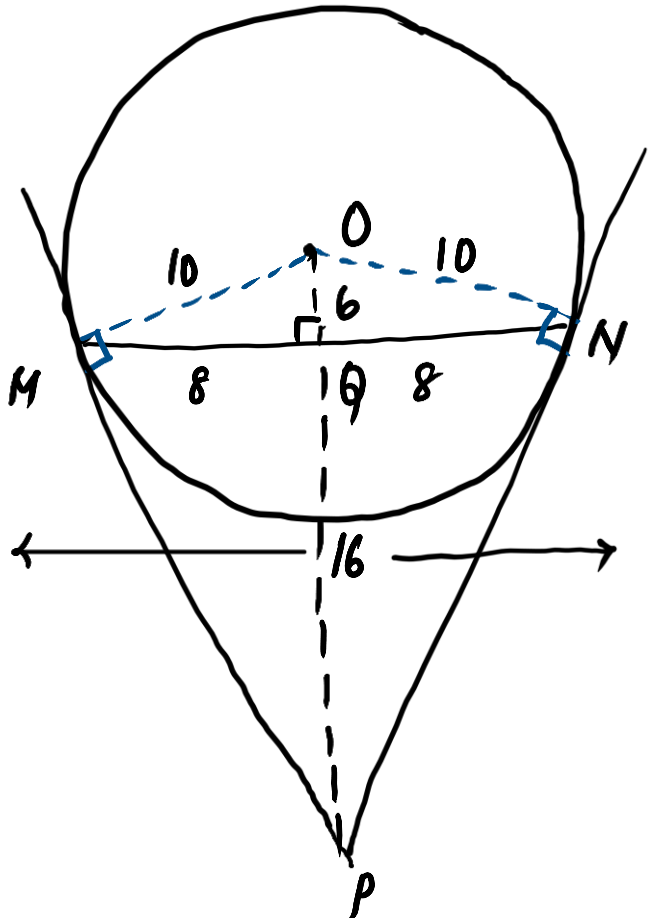
What is PM equal to ?

(a) 10 cm

(b) 12 cm

(c) $\frac{40}{3}$ cm

(d) $\frac{50}{3}$ cm



$\triangle OQM$ and $\triangle OMP$,

$\angle OQM = \angle OMP = 90^\circ$

$\angle MOQ = \angle MOP$ (same angle)

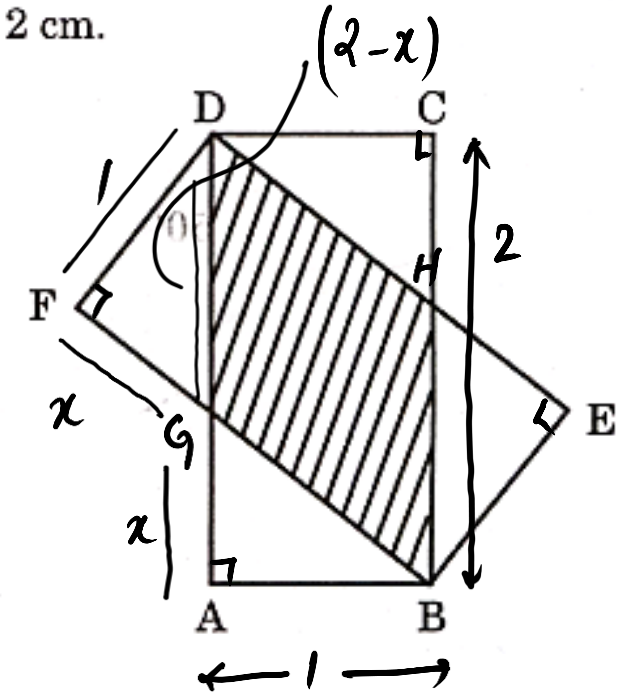
$OQM \sim \triangle OMP$,

$$\frac{OQ}{OM} = \frac{QM}{PM}$$

$$\frac{6}{10} = \frac{8}{PM} \qquad PM = \frac{80}{6} = \frac{40}{3}$$

PYQ – 2024 – I

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



All 4 right triangles are congruent.

What is the area of the overlapping region ?

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

(b) $\frac{5}{4}$ square cm

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

(d) $\frac{3}{4}$ square cm

ar(ABCD) − 2 ar(right triangle)

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

In $\triangle FGD$,

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

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

$4x = 3 \Rightarrow x = \frac{3}{4}$

$= \left(2 - 1 \times \frac{3}{4}\right)$

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

$= \frac{5}{4}\ cm^2$

PYQ – 2024 – I

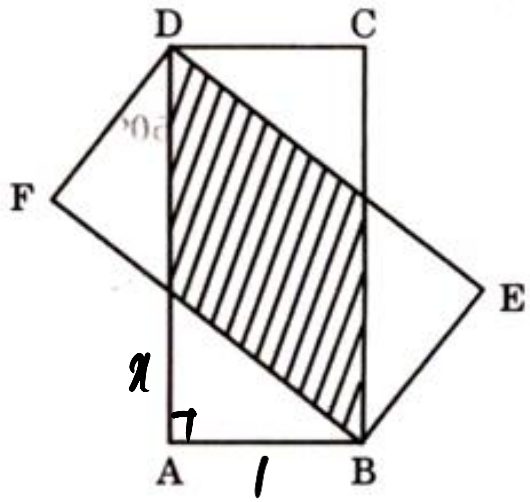
What is the area of the non-overlapping region ?

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

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

(c) $\frac{3}{2}$ square cm

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

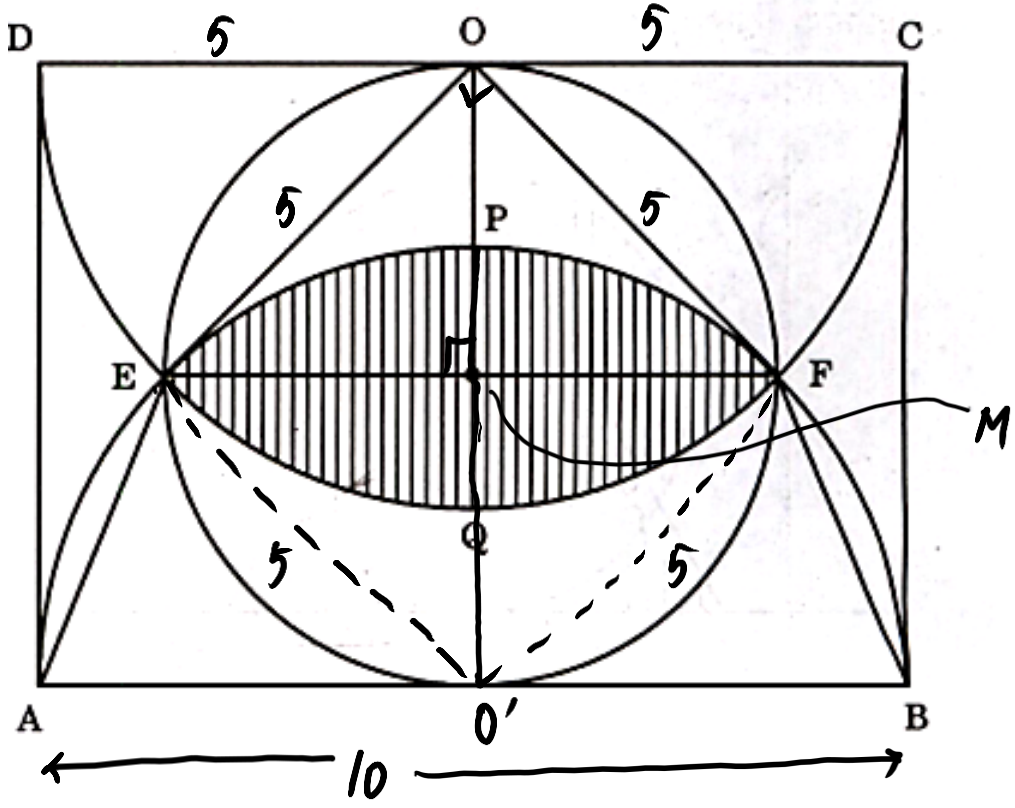


$4 \times$ ar(any right triangle)

$4 \times \frac{1}{2} \times 1 \times x = 2 \times \frac{3}{4} = \frac{3}{2}\ cm^2$

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

(Take $\pi = 3{\cdot}14$ and $\sqrt{2} = 1{\cdot}4$).



PYQ – 2024 – I

What is the area of triangle EOF ?

(a) $12{\cdot}5\sqrt{3}$ square cm

(b) $6{\cdot}25\sqrt{3}$ square cm

(c) 12·5 square cm

(d) 6·25 square cm

$\angle EOF = 90°$ (Angle in a semicircle)

EOFO' is a square.

In $\triangle OEF$

$EF^2 = 5^2 + 5^2 \Rightarrow EF = 5\sqrt{2}$ cm

$$EM = \frac{1}{2}(EF) = \frac{1}{2}(5\sqrt{2}) = \frac{5}{\sqrt{2}}\ cm$$

$$OM = \text{radius} = \frac{5}{\sqrt{2}}$$

$$ar(\triangle EOF) = \frac{1}{2} \times 5\sqrt{2} \times \frac{5}{\sqrt{2}} = \frac{25}{2} = \underline{12.5\ cm^2}$$

What is the area of trapezium AEFB ?

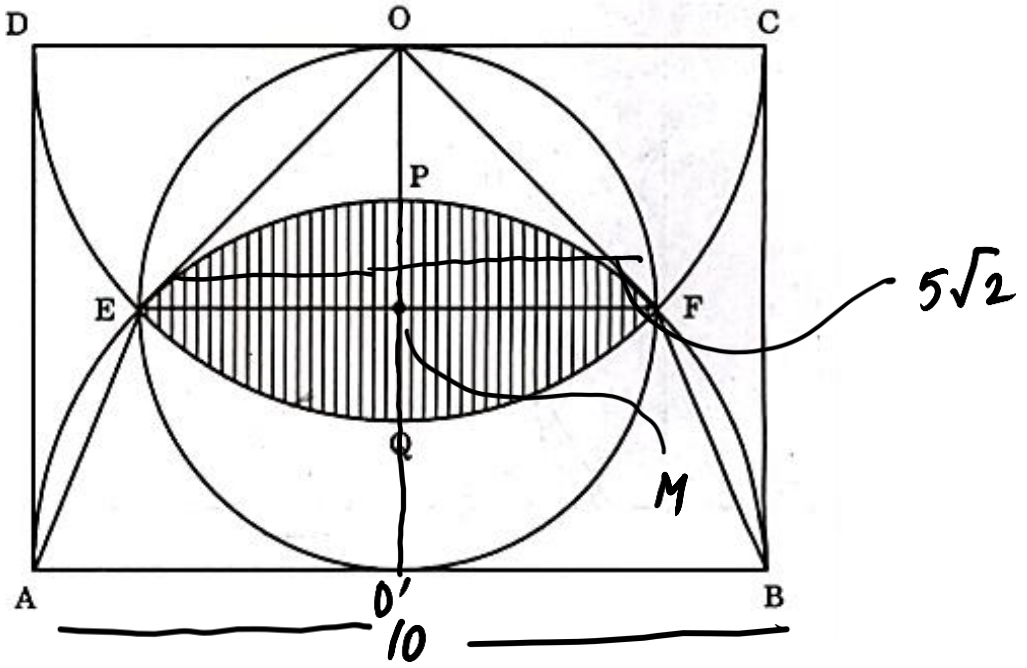
PYQ – 2024 – I

(a) 30 square cm

(b) 25 square cm

(c) 20 square cm

(d) 18·75 square cm



$OM = MO' = \frac{5}{\sqrt{2}}$

$\frac{1}{2} \times (10 + 5\sqrt{2}) \frac{5}{\sqrt{2}}$

PYQ – 2024 – I

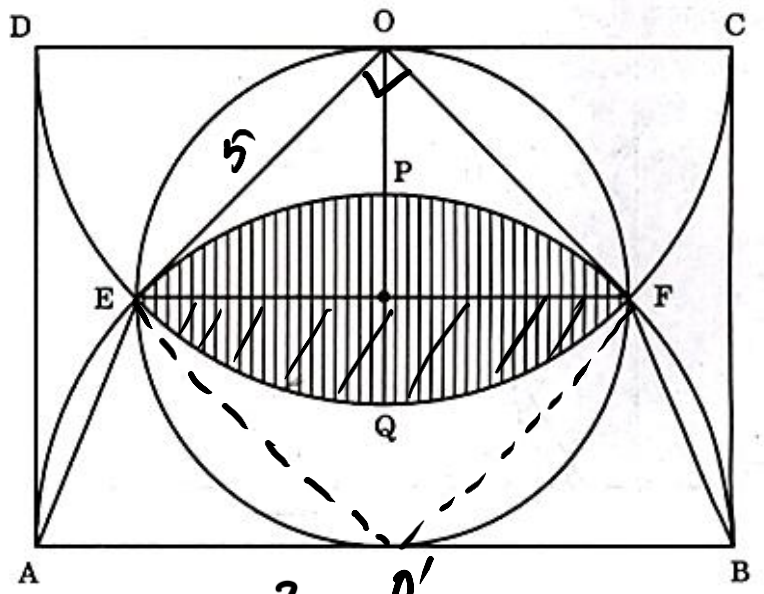
What is the area of the shaded region ?

(a) 14·75 square cm

(b) 14·25 square cm

(c) 7·225 square cm

(d) 7·625 square cm



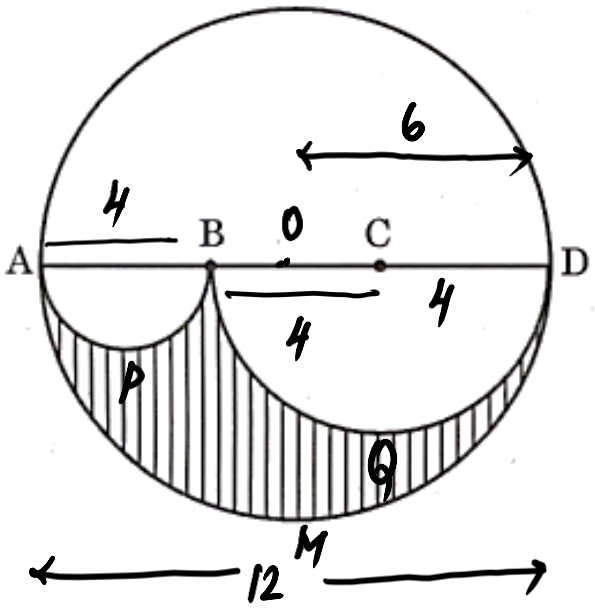
$$\left[ar(\text{sector } OEQF) - ar(\triangle OEF) \right] \times 2$$

$$\left[\frac{1}{4}\left(\pi (5)^2 \right) - 12.5 \right] \times 2$$

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

PYQ – 2024 – I

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.



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

(a) 2 : 7

(b) 2 : 5

(c) 3 : 5

(d) 5 : 8

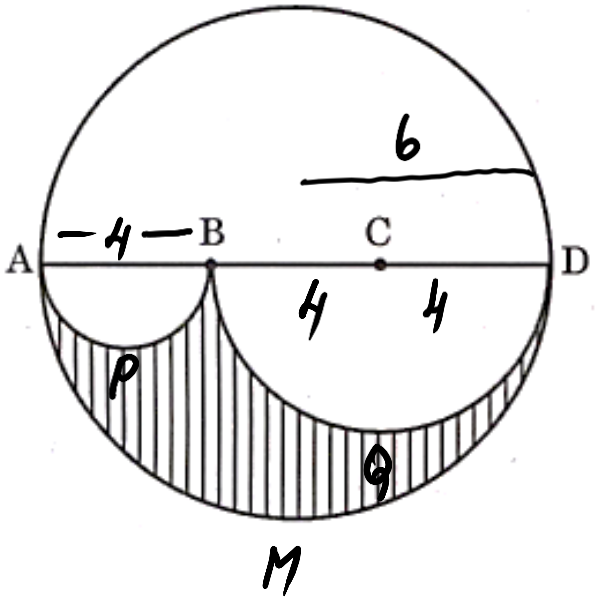
Shaded = ar(semi-circle AMD) − [ar(APB) + ar(BQD)]

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

$= 18\pi - (2\pi + 8\pi) = 8\pi$

Non-shaded $\Rightarrow \pi(6)^2 - 8\pi = 36\pi - 8\pi = 28\pi$

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



PYQ – 2024 – I

What is the perimeter of the shaded region ?

(a) 24π cm

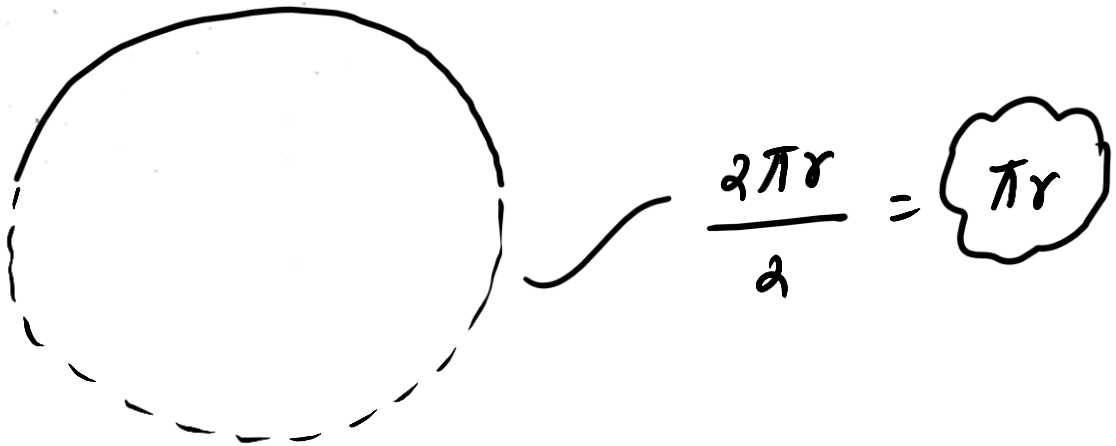
(b) 18π cm

(c) 15π cm

(d) 12π cm

$\text{arc}(AMD) + \text{ar}(APB) + \text{arc}(BQD)$

$6\pi + 4\pi + 2\pi = 12\pi$



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

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

$2\pi r = 4a$

$a = \frac{2\pi r}{4} = \frac{\pi r}{2}$

πr^2 a^2

πr^2 $\left(\frac{\pi r}{2}\right)^2$

$\pi r^2 > \frac{\pi r^2}{4}$

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

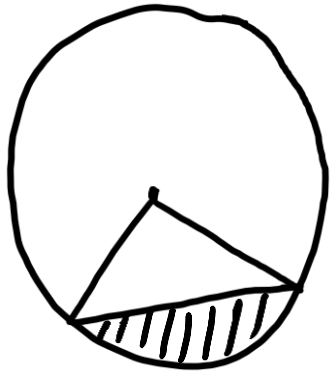
I. Area of a segment of a circle is less than area of its corresponding sector. ✓

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

$2\pi d$

$2 \times 3.14 \times d$

$6.28d > 6d$

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

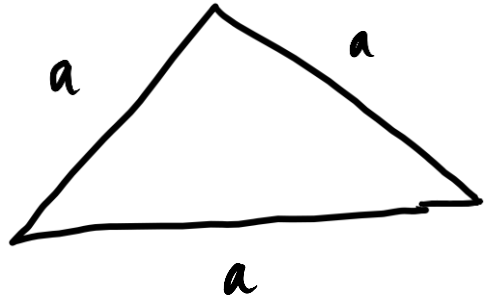
Ans: (c)

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

$$x = \frac{\sqrt{3}}{4}a^2 \qquad y = 3a$$



$$x = \frac{\sqrt{3}}{4}\left(\frac{y}{3}\right)^2$$

$$4x = \frac{\sqrt{3}y^2}{9} \Rightarrow 4x = \frac{y^2}{3\sqrt{3}} \Rightarrow 16x^2 = \frac{y^4}{27}$$

$$(16 \times 27)x^2 = y^4$$

$$432x^2 = y^4$$

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) $y^4 = 216x^2$

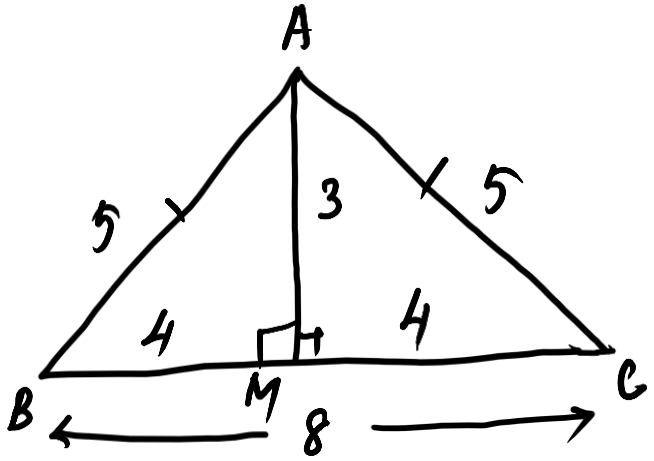
(c) $y^2 = 432x^2$ (d) None of these

Ans: (a)

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

(a) 18 cm (b) 16m

(c) 14 cm (d) 12 cm



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

$BC = 8$ cm

$\Delta ABM \cong \Delta AMC$ (by RHS)

$BM = CM$

perimeter $= 5 + 5 + 8$

$= 18$ cm

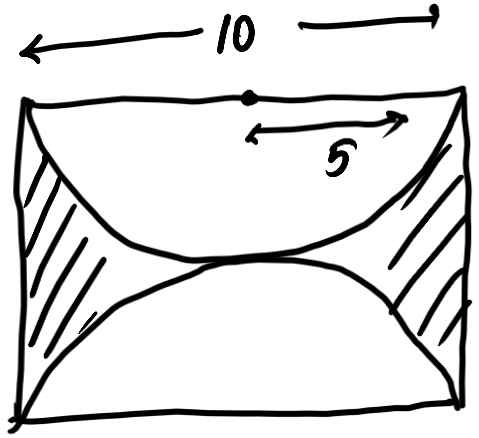
Q) The area of an isosceles ΔABC with $AB = AC$ and altitude $AD = 3$ cm is 12 sq cm. What is its perimeter?

(a) 18 cm
(b) 16m
(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



$(10)^2 - \pi(5)^2$

$100 - 25\pi$

$100 - 25 \times 3.14$

$= 21.5\ cm^2$

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) $17.5\ cm^2$ (b) $18.5\ cm^2$

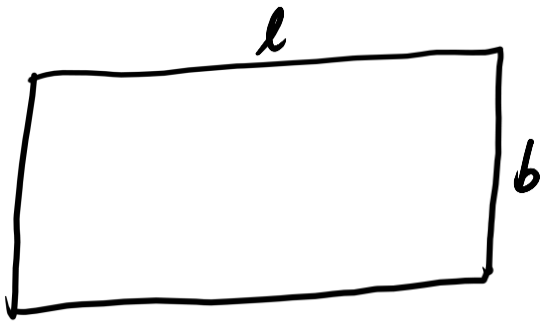
(c) $20.5\ cm^2$ (d) $21.5\ cm^2$

Ans: (d)

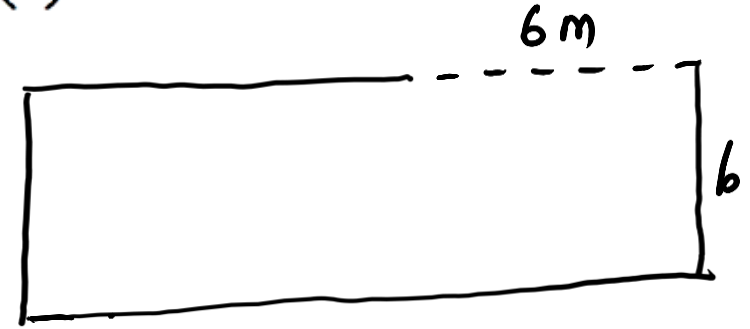
Q) The area of a rectangular field is 144 m^2. If the length had been 6 metres more, the area would have been 54 m^2 more. The original length of the field is

(a) 22 metres (b) 18 metres

(c) 16 metres (d) 24 metres



$lb = 144$



$(l+6)b = 144 + 54$

$144 + 6b = 198$

$6b = 54$

$b = 9$

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

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

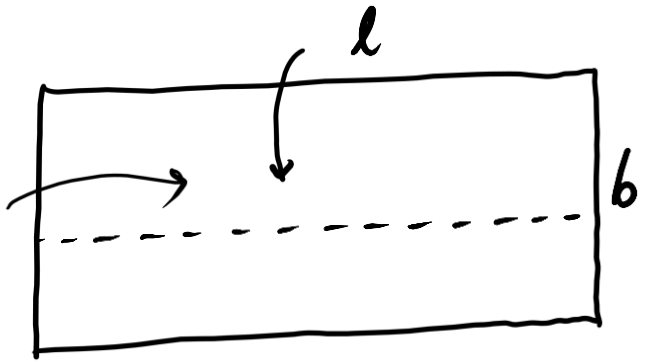
(c) 16 metres (d) 24 metres

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



$$34 = 2\left(l + \frac{b}{2}\right)$$

$$17 = l + \frac{b}{2}$$

$$34 = 2l + b$$

$$34 = 2(38 - 2b) + b$$

$$38 = 2\left(\frac{l}{2} + b\right)$$

$$19 = \frac{l}{2} + b$$

$$38 = 2b + l$$

$$34 = 2(38 - 2b) + b$$

$$34 = 76 - 4b + b$$

$$3b = 76 - 34$$

$$3b = 42$$

$$\underline{b = 14 \text{ cm}}$$

$$l = 38 - 2b$$

$$= 10 \text{ cm}$$

$$\text{Area} = lb = \underline{140 \text{ cm}^2}$$

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?

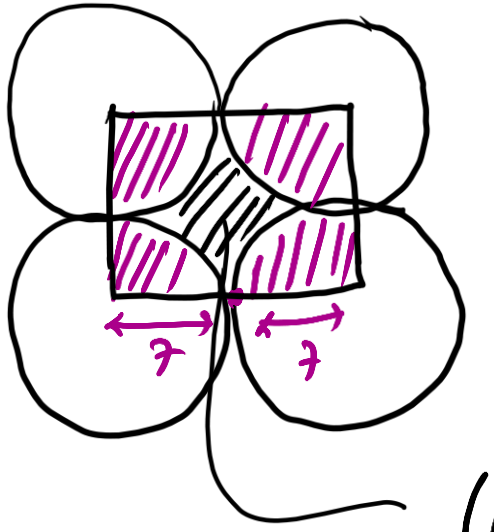
(a) 16 (b) 24 (c) 32 (d) 48

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) $196\ cm^2$



$(14)^2 - \pi(7)^2$

$196 - 49 \times 3.14 = 42\ cm^2$

$49 \times 3 = 147$ (2)

$196 - 155 = 41$

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) $12\ \text{cm}^2$

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

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

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

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

(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

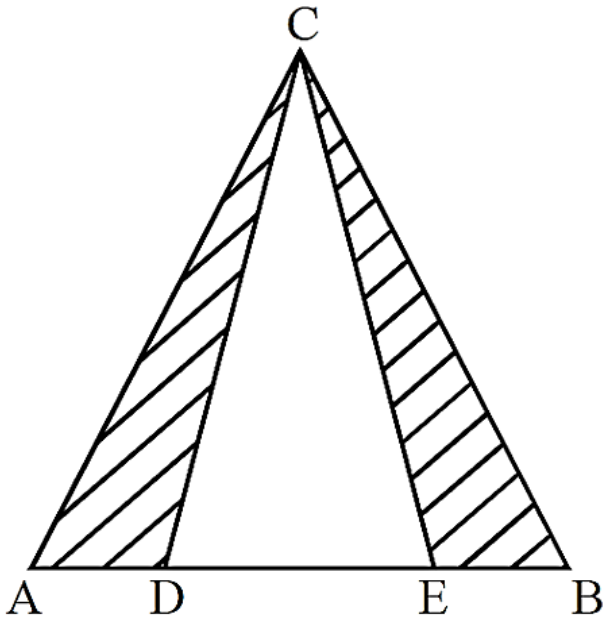
(b) 5 units

(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:



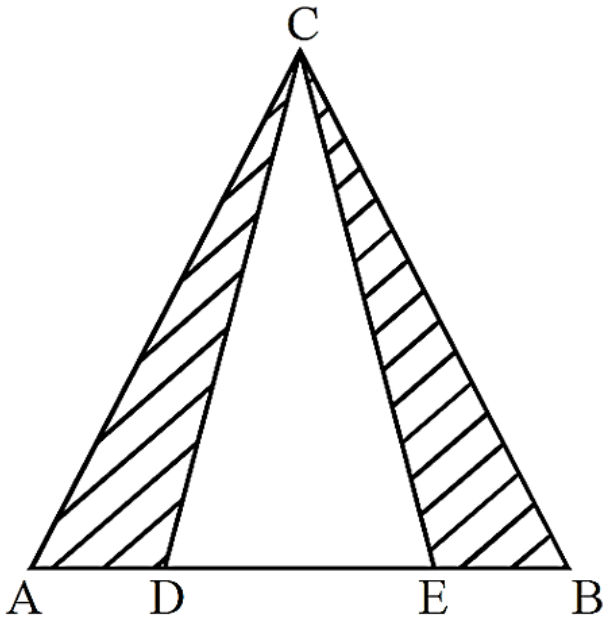
(a) $9\,\text{cm}^2$

(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) $9\,\text{cm}^2$

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

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

(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

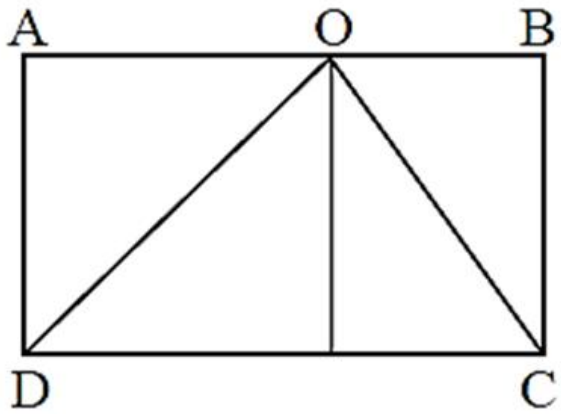
(a) 1800 (b) 200 (c) 2000 (d) 2150

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 ΔCOD is



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

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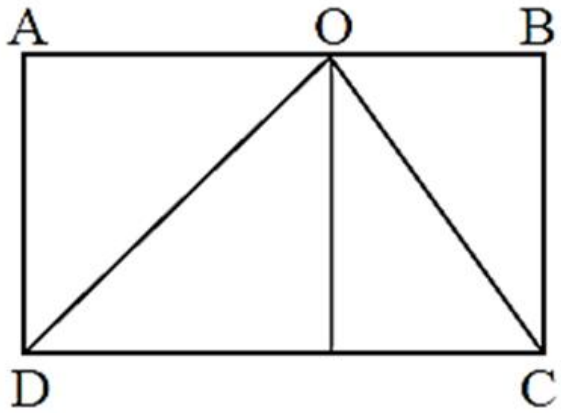

(a) 40 sq cm
(b) 45 sq cm
(c) 50 sq cm
(d) 80 sq cm

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

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(a) 40π sq cm
(b) 40 sq cm
(c) 80 sq cm
(d) 20π sq cm

Ans: (c)

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

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Ans: (b)

Q) Three congruent circles each of radius 4 cm touch one another. What is the area (in cm^2) of the portion included between them?

(a) 8π

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

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

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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) $33\text{ cm} < p < 34\text{ cm}$

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

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Ans: (c)

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