CDS-AFCAT 1 2025

SSBCrack EXAMS

LIVE

MATHS

MENSURATION 2D

CLASS 3

NAVJYOTI SIR

29 Oct 2024 Live Classes Schedule

8:00AM	29 OCTOBER 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	29 OCTOBER 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

NDA 1 2025 LIVE CLASSES

11:30AM	GK - POLITY - MCQ CLASS	RUBY MA'AM
1:00PM	CHEMISTRY - THERMODYNAMICS	SHIVANGI MA'AM
4:00PM	MATHS - ANALYTICAL GEOMETRY 3D - CLASS 2	NAVJYOTI SIR
5:30PM	ENGLISH - FILL IN THE BLANKS - CLASS 2	ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

11:30AM	GK - POLITY - MCQ CLASS	RUBY MA'AM
1:00PM	CHEMISTRY - THERMODYNAMICS	SHIVANGI MA'AM
5:30PM	ENGLISH - FILL IN THE BLANKS - CLASS 2	ANURADHA MA'AM
7:00PM	MATHS - MENSURATION 2D - CLASS 3	NAVJYOTI SIR

AFCAT 1 2025 LIVE CLASSES

4:00PM	STATIC GK - IMPORTANT STRAITS & INTERNATIONAL BORDERS	DIVYANSHU SIR
5:30PM	ENGLISH - FILL IN THE BLANKS - CLASS 2	ANURADHA MA'AM
7:00PM	MATHS - MENSURATION 2D - CLASS 3	NAVJYOTI SIR

PYQ – 2024 – I

A circle touches all the four sides AB, BC, CD, DA of a quadrilateral ABCD.

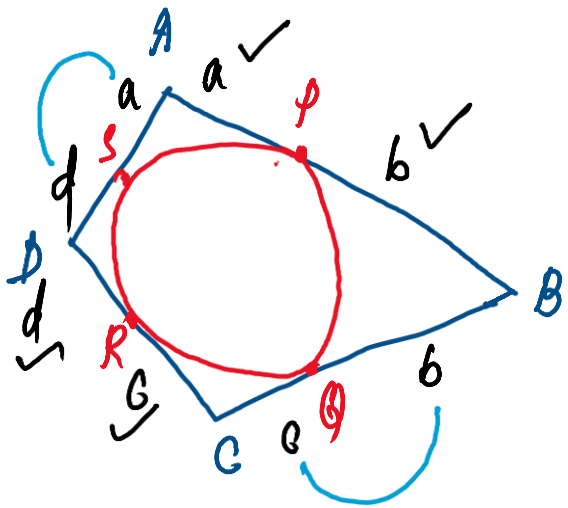
Question : What is the perimeter of the quadrilateral ?

Statement-I : AB + DC = 10 cm

Statement-II : AD + BC = 10 cm

$a+b+c+d=10$

$a+b+c+d=10$



how many statements being used,

(a) only one

(b) any one

(c) both

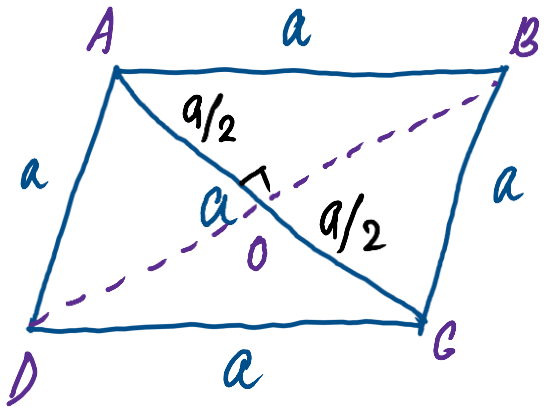
(d) neither of two

PYQ – 2024 – I

Question : What is the ratio of the lengths of diagonals of a rhombus ?

Statement-I : One diagonal of the rhombus is equal to its side.

Statement-II : The longer diagonal of the rhombus is equal to $\sqrt{3}$ times its side.



In right triangle, AOB,

$a^2 = \left(\frac{a}{2}\right)^2 + OB^2$

$a^2 - \frac{a^2}{4} = OB^2$

$OB = \frac{\sqrt{3}a}{2}$

$BD = 2\left(\frac{\sqrt{3}a}{2}\right) = \sqrt{3}a$

$\frac{AC}{BD} = \frac{a}{\sqrt{3}a} = \frac{1}{\sqrt{3}}$

Ans. (b) any one will give the answer.

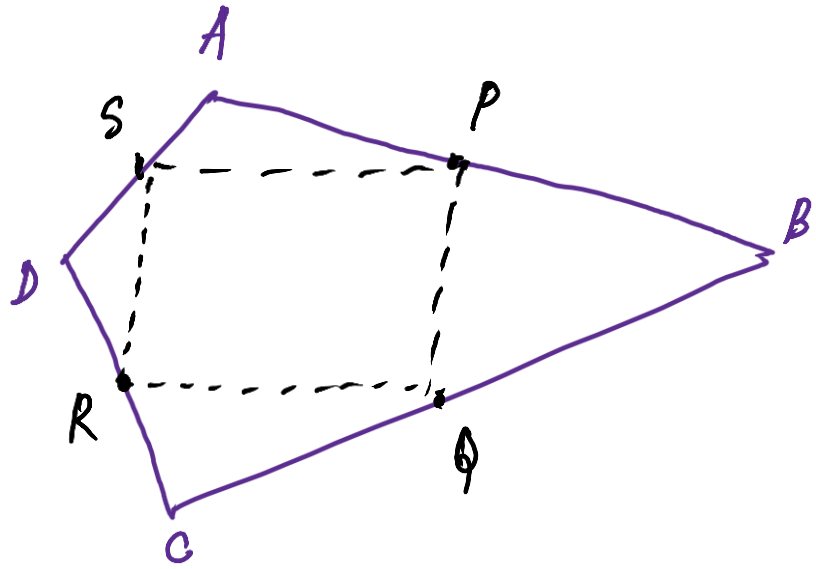
PYQ – 2024 – I

P, Q, R, S are the mid-points of sides AB, BC, CD, DA respectively of a quadrilateral ABCD.

Question : What is the difference in the area of the quadrilateral ABCD and the area of the quadrilateral PQRS ?

Statement-I : Area of the quadrilateral ABCD is 100 square unit.

Statement-II : Area of the quadrilateral PQRS is 50 square unit.



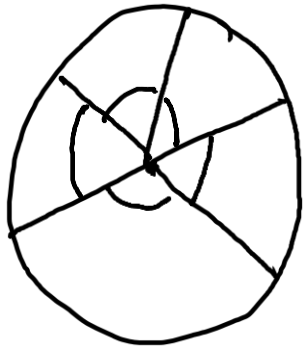
$$ar(PQRS) = \frac{1}{2} ar(ABCD)$$

(b) any one of statements.

PYQ – 2024 – I

In a pie-diagram (with radius 7 cm), the central angles of the sectors are in the ratio 2 : 3 : 7 : 5 : 1.

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



If P is the area of the smallest sector and Q is the area of the largest sector, then what is P + Q equal to ?

(a) $\frac{88}{3}$ square cm

(b) $\frac{77}{3}$ square cm

(c) $\frac{149}{6}$ square cm

(d) ✓ $\frac{616}{9}$ square cm

2 : 3 : 7 : 5 : 1

$P \rightarrow \frac{1}{18} \times \pi r^2$

$Q \rightarrow \frac{7}{18} \times \pi r^2$

$P + Q \rightarrow \left(\frac{1}{18} + \frac{7}{18}\right) \times \pi r^2$

$\frac{8}{18} \times \frac{11}{7} \times 7 \times 7$

$\frac{616}{9}$ ✓

In a pie-diagram (with radius 7 cm), the central angles of the sectors are in the ratio 2 : 3 : 7 : 5 : 1.

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

PYQ – 2024 – I

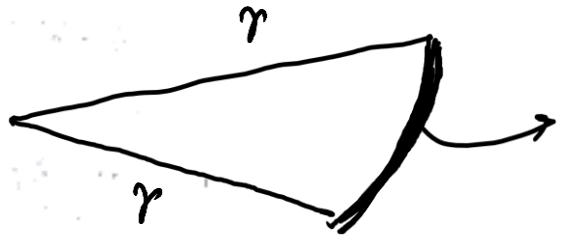
If p is the perimeter of the smallest sector, then what is the value of 9p ?

(a) 142 cm

(b) 148 cm ✓

(c) 156 cm

(d) 221 cm



portion of $2\pi r$

$$p = 2r + \frac{1}{18} \times 2\pi r$$

$$= 2\times 7 + \frac{1}{9} \times \frac{22}{7} \times 7$$

$$= 14 + \frac{22}{9}$$

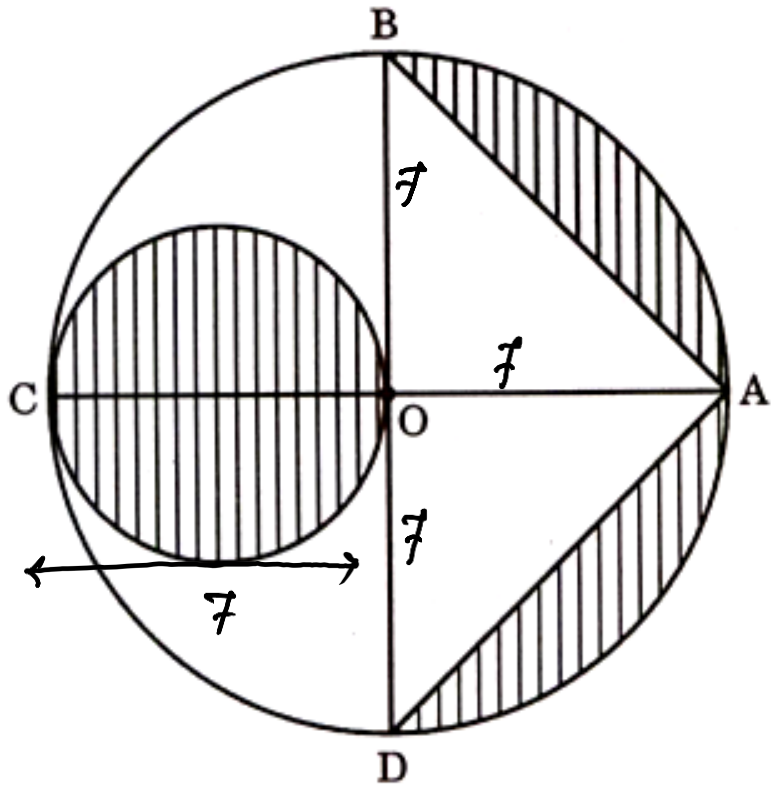
$$9p = 9\left(14 + \frac{22}{9}\right)$$

$$= 126 + 22$$

$$= 148$$

PYQ – 2024 – I

ABCD is a circle with centre O and taking OC as a diameter, a circle is drawn as shown in the figure given below. Let OB = 7 cm. (Use $\pi = \frac{22}{7}$)



What is the area of the shaded region ?

(a) 38·5 square cm

(b) 48 square cm

(c) 52·5 square cm

(d) 66·5 square cm ✓

(area of circle + (ar (semi-circle) − ar (triangle BDA))

$\frac{22}{7} \times \left(\frac{7}{2}\right)^2 + \left(\frac{\frac{22}{7}(7)^2}{2} - \frac{1}{2} \times 14 \times 7\right)$

$\frac{22 \times 7}{4} + (77 - 49) = 38.5 + 28 = 66.5$

PYQ – 2024 – I

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

(a) $\frac{19}{25}$ ✓

(b) $\frac{18}{25}$

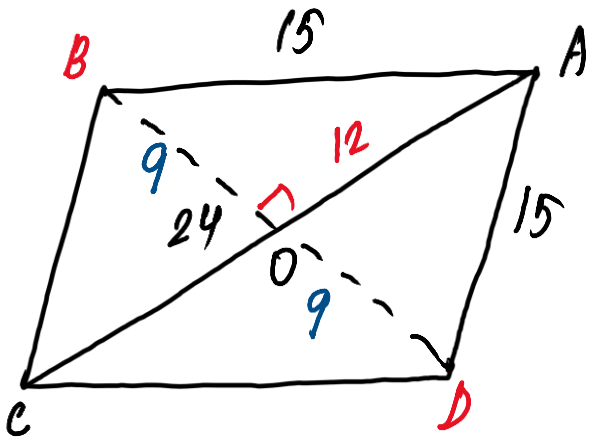
(c) $\frac{17}{25}$

(d) $\frac{16}{25}$

$$\frac{66.5}{154 - 66.5} = \frac{66.5}{87.5} = \frac{665}{875} = \frac{133}{175} = \frac{19}{25}$$

Q) The perimeter of a rhombus is 60 cm and one of its diagonal is 24 cm. The area (in sq. cm.) of the rhombus is

(a) 206 (b) 432 (c) 108 (d) 216



$\triangle AOB$,

$OB^2 = 15^2 - 12^2 = 225 - 144 = 81$

$OB = 9$

$BD = 2 \times 9 = 18$

$\text{Area} = \frac{1}{2} \times \text{diag}(1) \times \text{diag}(2) = \frac{1}{2} \times 24 \times 18 = 12 \times 18 = 216 \text{ cm}^2$

Q) The perimeter of a rhombus is 60 cm and one of its diagonal is 24 cm. The area (in sq. cm.) of the rhombus is

(a) 206 (b) 432 (c) 108 (d) 216

Ans: (d)

Q) The two sides of a triangle are 40 cm and 41 cm. If the perimeter of the triangle is 90 cm, what is its area?

(*a*) $90\ cm^2$ (*b*) $135\ cm^2$ (*c*) $150\ cm^2$ (*d*) $180\ cm^2$

$a = 40$

$b = 41$

$c = 90 - (40 + 41) = 9$

$s = \frac{a+b+c}{2} = \frac{90}{2} = 45$

$\text{area} = \sqrt{45(45-40)(45-41)(45-9)}$

$= \sqrt{45 \times 5 \times 4 \times 36}$

$= \sqrt{5 \times 9 \times 5 \times 4 \times 4 \times 9}$

$= 5 \times 9 \times 4 = 45 \times 4 = 180$

Q) The two sides of a triangle are 40 cm and 41 cm. If the perimeter of the triangle is 90 cm, what is its area?

(*a*) $90\ cm^2$ (*b*) $135\ cm^2$ (*c*) $150\ cm^2$ (*d*) $180\ cm^2$

Ans: (d)

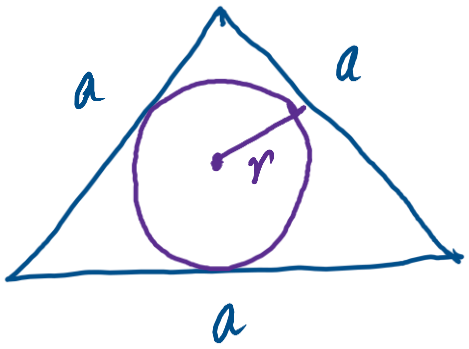
Q) If the area of a circle, inscribed in an equilateral triangle is 4π cm², then what is the area of the triangle?

(a) $12\sqrt{3}$ cm² ✓

(b) $9\sqrt{3}$ cm²

(c) $8\sqrt{3}$ cm²

(d) 18 cm²



$r = \frac{a}{2\sqrt{3}}$

$\pi r^2 = 4\pi$

$r^2 = 4$

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

$a^2 = 4 \times 12$

area of $\triangle$le

$\frac{\sqrt{3}}{4} a^2$

$\frac{\sqrt{3}}{4}(48) = 12\sqrt{3}$ cm²

Q) If the area of a circle, inscribed in an equilateral triangle is 4π cm², then what is the area of the triangle?

(a) $12\sqrt{3}$ cm²

(b) $9\sqrt{3}$ cm²

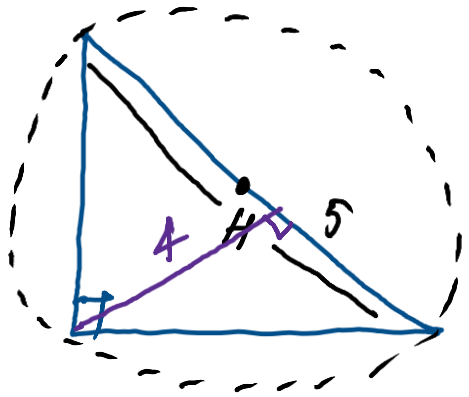
(c) $8\sqrt{3}$ cm²

(d) 18 cm²

Ans: (a)

Q) What is the area of a right-angled triangle, if the radius of the circumcircle is 5 cm and altitude drawn to the hypotenuse is 4 cm?

(*a*) $20\ cm^2$ (*b*) $18\ cm^2$ (*c*) $16\ cm^2$ (*d*) $10\ cm^2$



$H = 2 \times 5 = 10\ cm$

$\text{area} = \frac{1}{2} \times b \times h$

$= \frac{1}{2} \times 10 \times 4 = 20\ cm^2$

Q) What is the area of a right-angled triangle, if the radius of the circumcircle is 5 cm and altitude drawn to the hypotenuse is 4 cm?

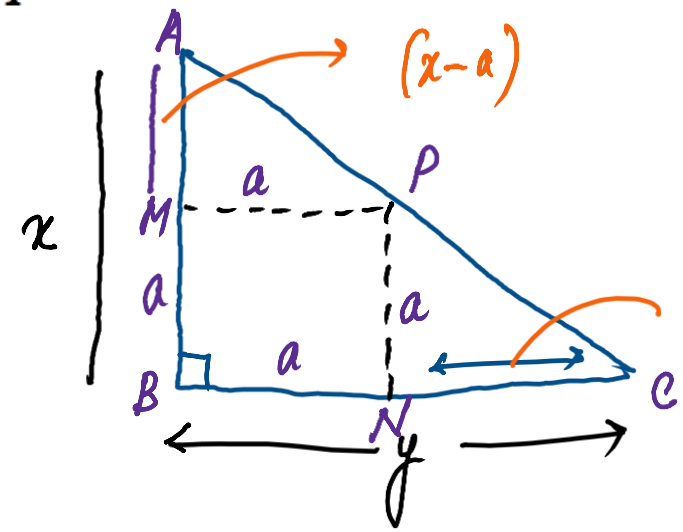
(*a*) $20\ cm^2$ (*b*) $18\ cm^2$ (*c*) $16\ cm^2$ (*d*) $10\ cm^2$

Ans: (a)

Q) A square is inscribed in a right triangle with legs x and y and has common right angle with the triangle. The perimeter of the square is given by

(a) $\frac{2xy}{x+y}$ (b) $\frac{4xy}{x+y}$

(c) $\frac{2xy}{\sqrt{x^2+y^2}}$ (d) $\frac{4xy}{\sqrt{x^2+y^2}}$



$4a$

$\frac{4xy}{x+y}$

$ar(\triangle ABC) = ar(\triangle AMP) + ar(\text{square } MPNB) + ar(\triangle PNC)$

$\frac{1}{2}xy = \frac{1}{2}a(x-a) + a^2 + \frac{1}{2}(y-a)a$

$xy = ax - a^2 + 2a^2 + ya - a^2$

$xy = ax + ay$

$\left(a = \frac{xy}{x+y}\right)$

$\frac{1}{a} = \frac{1}{x} + \frac{1}{y}$

Q) A square is inscribed in a right triangle with legs x and y and has common right angle with the triangle. The perimeter of the square is given by

(a) $\frac{2xy}{x+y}$

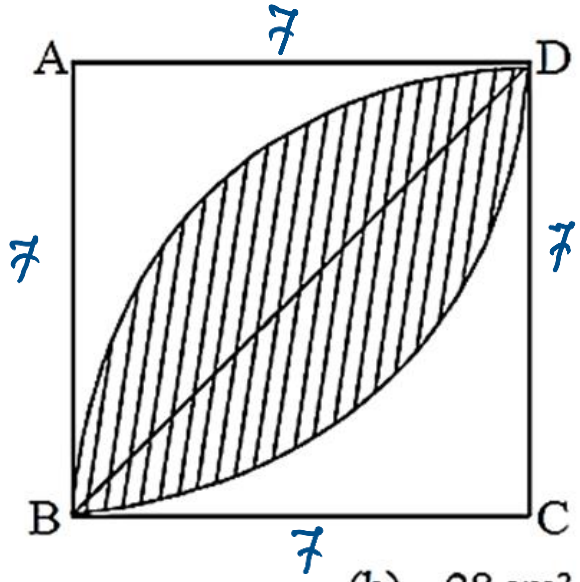
(b) $\frac{4xy}{x+y}$

(c) $\frac{2xy}{\sqrt{x^2+y^2}}$

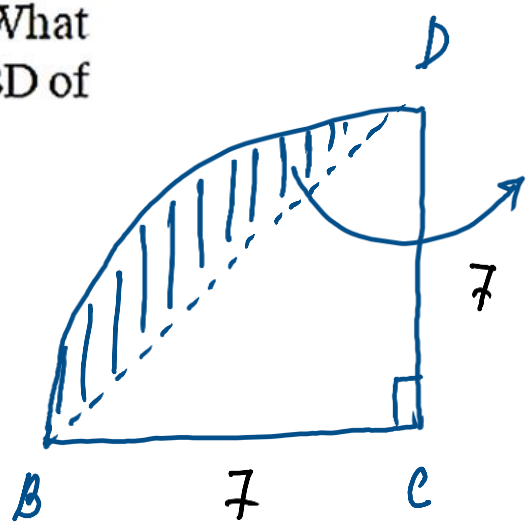
(d) $\frac{4xy}{\sqrt{x^2+y^2}}$

Ans: (b)

Q) In the given figure, the side of square ABCD is 7 cm. What is the area of the shaded portion, formed by the arcs BD of the circles with centre at C and A?



(a) 7 cm²
(b) 28 cm²
(c) 14 cm²
(d) 21 cm²



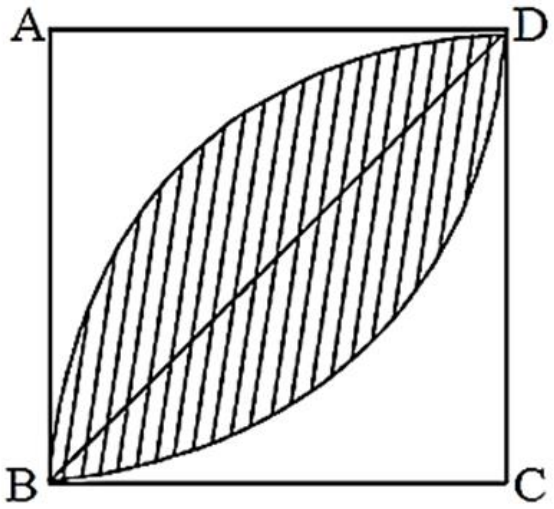
quadrant − area of right triangle

$$2 \times \left(\frac{1}{4} \times \frac{22}{7} \times 7 \times 7 - \frac{1}{2} \times 7 \times 7 \right)$$

$$11 \times 7 - 49 = 77 - 49$$

$$= 28 \text{ cm}^2$$

Q) In the given figure, the side of square ABCD is 7 cm. What is the area of the shaded portion, formed by the arcs BD of the circles with centre at C and A?

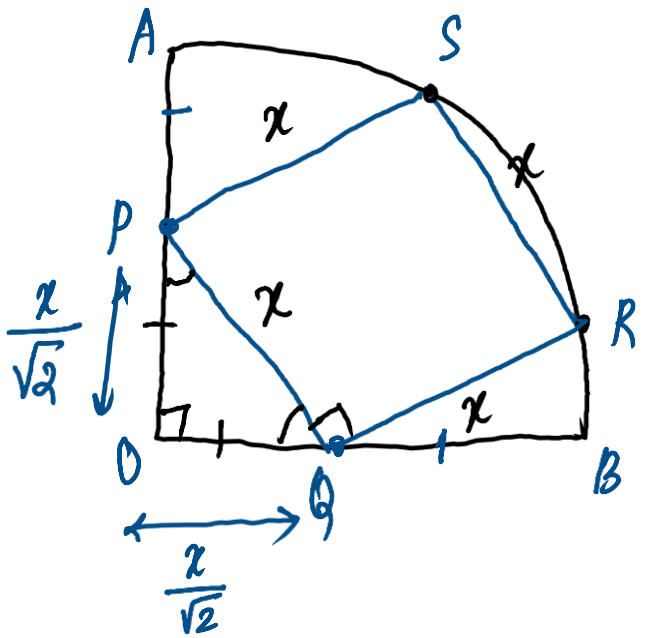


(a) $7\ cm^2$
(b) $28\ cm^2$
(c) $14\ cm^2$
(d) $21\ cm^2$

Ans: (b)

Q) A square is inscribed in a quarter–circle in such a manner that two of its adjacent vertices lie on the two radii at an equal distance from the centre, while the other two vertices lie on the circular arc. If the square has sides of length x, then the radius of the circle is

(a) $\frac{16x}{\pi+4}$ (b) $\frac{2x}{\sqrt{\pi}}$ (c) $\frac{\sqrt{5}x}{\sqrt{2}}$ (d) $\sqrt{2}x$



$OP = OQ$ | $OA = OB$,

So $QB = AP$

Q) A square is inscribed in a quarter–circle in such a manner that two of its adjacent vertices lie on the two radii at an equal distance from the centre, while the other two vertices lie on the circular arc. If the square has sides of length x, then the radius of the circle is

(a) $\frac{16x}{\pi+4}$ (b) $\frac{2x}{\sqrt{\pi}}$ (c) $\frac{\sqrt{5}x}{\sqrt{2}}$ (d) $\sqrt{2}x$

Ans: (d)

Q) Four equal discs are placed such that each one touches two others. If the area of empty space enclosed by them is 150/847 square centimetre, then the radius of each disc is equal to

(a) 7/6 cm
(b) 5/6 cm
(c) 1/2 cm
(d) 5/11 cm

Q) Four equal discs are placed such that each one touches two others. If the area of empty space enclosed by them is 150/847 square centimetre, then the radius of each disc is equal to

(a) 7/6 cm
(b) 5/6 cm
(c) 1/2 cm
(d) 5/11 cm

Ans: (d)

Q) ABC is a triangle right angled at A. AB = 6 cm and AC = 8 cm. Semi-circles drawn (outside the triangle) on AB, AC and BC as diameters which enclose areas x, z square units. respectively. What is $x + y - z$ equal to?

(a) 48 cm²
(b) 32 cm²
(c) 0
(d) None of these

Q) ABC is a triangle right angled at A. AB = 6 cm and AC = 8 cm. Semi-circles drawn (outside the triangle) on AB, AC and BC as diameters which enclose areas x, z square units. respectively. What is $x + y - z$ equal to?

(a) 48 cm²
(b) 32 cm²
(c) 0
(d) None of these

Ans: (c)

Q) What is the area of the larger segment of a circle formed by a chord of length 5 cm subtending an angle of 90° at the centre?

(a) $\frac{25}{4}\left(\frac{\pi}{2}+1\right)\text{cm}^2$

(b) $\frac{25}{4}\left(\frac{\pi}{2}-1\right)\text{cm}^2$

(c) $\frac{25}{4}\left(\frac{3\pi}{2}+1\right)\text{cm}^2$

(d) None of these

Q) What is the area of the larger segment of a circle formed by a chord of length 5 cm subtending an angle of 90° at the centre?

(a) $\frac{25}{4}\left(\frac{\pi}{2}+1\right)\text{cm}^2$

(b) $\frac{25}{4}\left(\frac{\pi}{2}-1\right)\text{cm}^2$

(c) $\frac{25}{4}\left(\frac{3\pi}{2}+1\right)\text{cm}^2$

(d) None of these

Ans: (c)

Q) If AB and CD are two diameters of a circle of radius r and they are mutually perpendicular, then what is the ratio of the area of the circle to the area of the ΔACD?

(a) $\frac{\pi}{2}$

(b) π

(c) $\frac{\pi}{4}$

(d) 2π

Q) If AB and CD are two diameters of a circle of radius r and they are mutually perpendicular, then what is the ratio of the area of the circle to the area of the ΔACD?

(a) $\frac{\pi}{2}$ (b) π

(c) $\frac{\pi}{4}$ (d) 2π

Ans: (b)

Q) The area of a rectangle lies between 40 cm^2 and 45 cm^2. If one of the sides is 5 cm, then its diagonal lies between

(a) 8 cm and 10 cm
(b) 9 cm and 11 cm
(c) 10 cm and 12 cm
(d) 11 cm and 13 cm

Q) The area of a rectangle lies between 40 cm^2 and 45 cm^2. If one of the sides is 5 cm, then its diagonal lies between

(a) 8 cm and 10 cm
(b) 9 cm and 11 cm
(c) 10 cm and 12 cm
(d) 11 cm and 13 cm

Ans: (b)

Q) The ratio of the outer and inner perimeters of a circular path is 23 : 22. If the path is 5 m wide, the diameter of the inner circle is

(a) 55 m
(b) 110m
(c) 220 m
(d) 230 m

Q) The ratio of the outer and inner perimeters of a circular path is 23 : 22. If the path is 5 m wide, the diameter of the inner circle is

(a) 55 m
(b) 110m
(c) 220 m
(d) 230 m

Ans: (c)

Q) Four equal-sized maximum circular plates are cut off from a square paper sheet of area 784 square cm. The circumference of each plate is

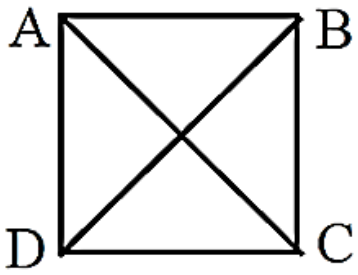
(a) 11 cm
(b) 22 cm
(c) 33 cm
(d) 44 cm

Q) Four equal-sized maximum circular plates are cut off from a square paper sheet of area 784 square cm. The circumference of each plate is

(a) 11 cm
(b) 22 cm
(c) 33 cm
(d) 44 cm

Ans: (d)

Q) $ABCD$ is a square of area 4, which is divided into four non overlapping triangles as shown in the fig. Then the sum of the perimeters of the triangles is



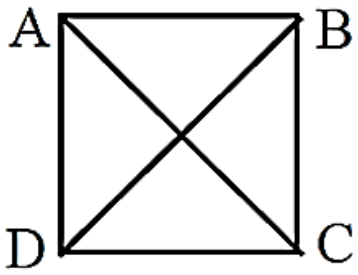
(a) $8(2+\sqrt{2})$

(b) $8(1+\sqrt{2})$

(c) $4(1+\sqrt{2})$

(d) $4(2+\sqrt{2})$

Q) $ABCD$ is a square of area 4, which is divided into four non overlapping triangles as shown in the fig. Then the sum of the perimeters of the triangles is



(a) $8(2+\sqrt{2})$

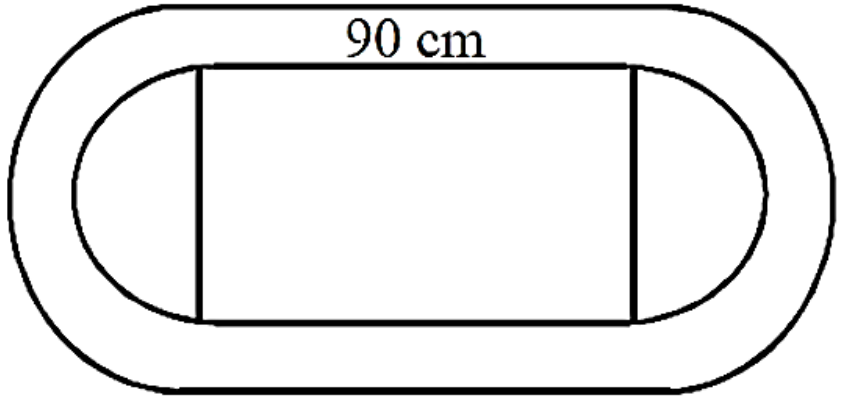
(b) $8(1+\sqrt{2})$

(c) $4(1+\sqrt{2})$

(d) $4(2+\sqrt{2})$

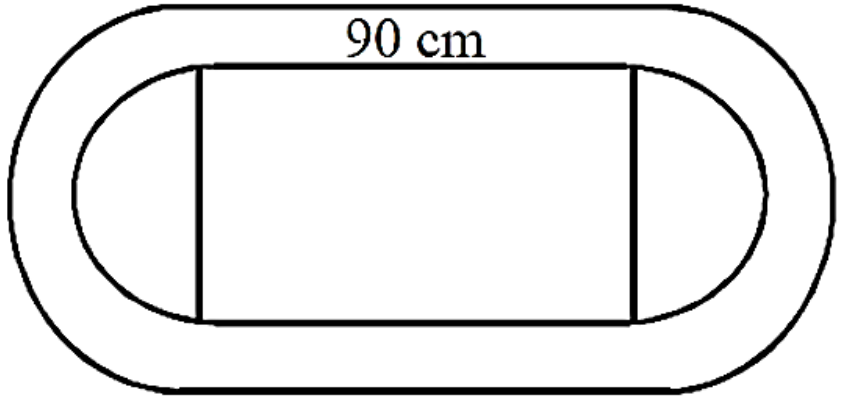
Ans: (b)

Q) The inside perimeter of a practice running track with semi-circular ends and straight parallel sides is 312 m. The length of the straight portion of the track is 90 m. If the track has a uniform width of 2 m throughout, find its area.



(a) $5166\,m^2$
(b) $5802.57\,m^2$
(c) $636.57\,m^2$
(d) $1273.14\,m^2$

Q) The inside perimeter of a practice running track with semi-circular ends and straight parallel sides is 312 m. The length of the straight portion of the track is 90 m. If the track has a uniform width of 2 m throughout, find its area.



(a) $5166\,m^2$
(b) $5802.57\,m^2$
(c) $636.57\,m^2$
(d) $1273.14\,m^2$

Ans: (c)

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SSBCrack EXAMS

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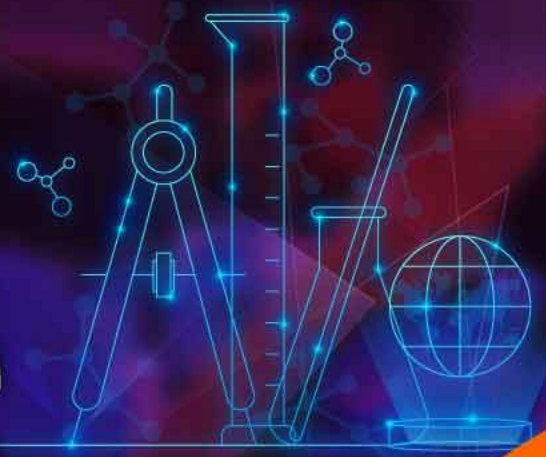
MENSURATION 2D

CLASS 4



NAVJYOTI SIR