



# MATHS

**BOOKS - S CHAND IIT JEE**

**FOUNDATION**

**AREA AND PERIMETER OF RHOMBUS,  
TRAPEZIUM AND POLYGONS**

**Solved Examples**

1. The diagonal of a rhombus are 24 cm and 10cm. What is the perimeter of the rhombus?



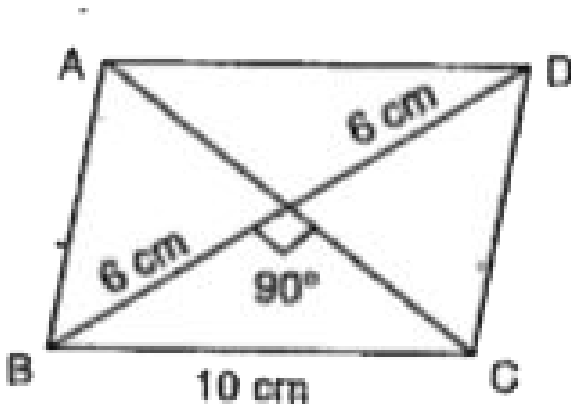
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2. The area of a rhombus is  $150 \text{ cm}^2$ . The length of one of its diagonal is 10 cm. What is the length of the other diagonal ?



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3. The perimeter of a rhombus is 40 cm. If the length of one of its diagonal is 10 cm, what is the length of the other diagonal?



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4. The length of one side of a rhombus is 6.5 cm and its altitude is 10 cm. If the length of one of its diagonal is 26 cm, what will be the length of the other diagonal?



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5. The area of a field in the shape of trapezium measures  $1440 \text{ m}^2$ . The perpendicular distance between its parallel sides is 24 m. If

the ratio of the parallel sides is 5 : 3, the length of the longer parallel side is :



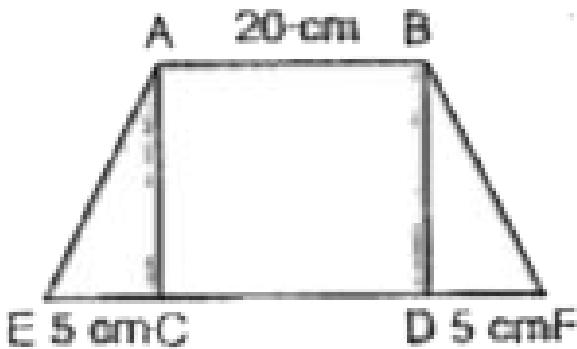
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6. The difference between the two parallel sides of a trapezium is 8 m. The perpendicular distance between them is 24 m. If the area of the trapezium is  $312 \text{ m}^2$ , then what are the length of the two parallel sides ?



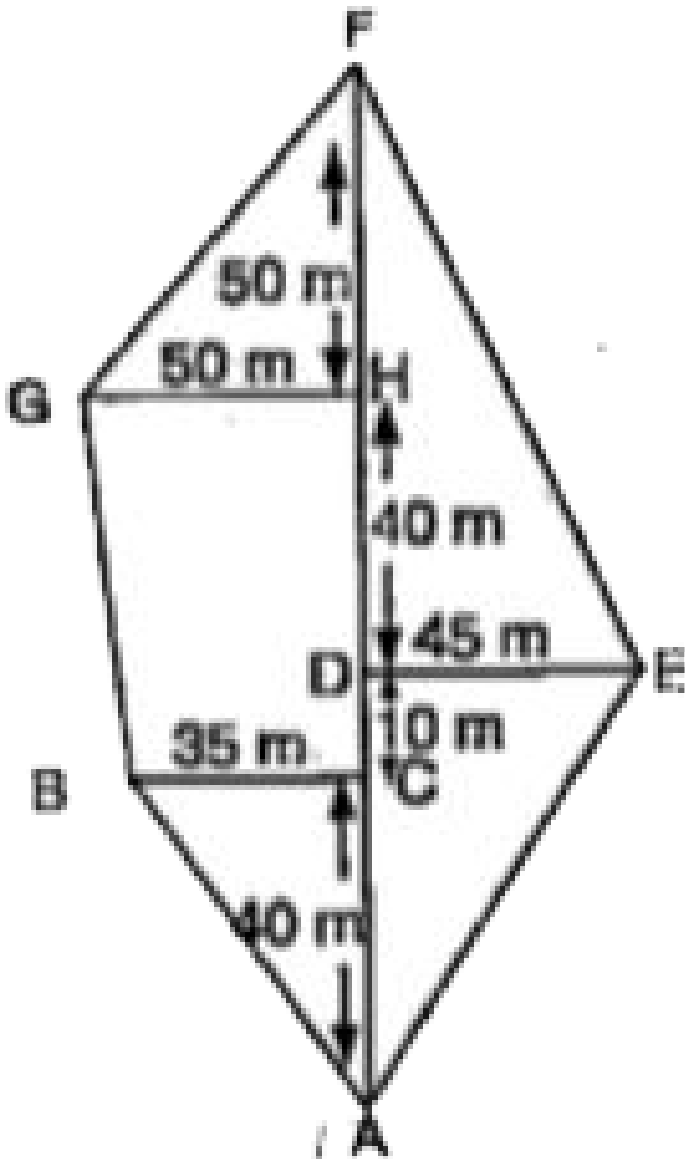
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7. If the length of the parallel sides of an isosceles trapezium are 20 cm and 30 cm and the area is  $100 \text{ cm}^2$ , then what is the length of the non-parallel sides ?



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8. What will be the area of the field ABGFEA ?





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## Question Bank 26

1. The side of a rhombus is 10 cm and one diagonal is 16 cm. The area of the rhombus is

A.  $96 \text{ cm}^2$

B.  $95 \text{ cm}^2$

C.  $94 \text{ cm}^2$



D.  $93 \text{ cm}^2$

**Answer: A**



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2. If the diagonal of a rhombus are 24 cm and 10 cm, then the area and perimeter of the rhombus are respectively

A. 120 sq cm, 52 cm

B. 240 sq cm, 52 cm

C. 120 sq cm, 64 cm

D. 240 sq cm, 64 cm

**Answer: A**



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**3.** The diagonals of a rhombus are 32 cm and 60 cm. What is the perimeter of the rhombus?

A. 80 cm

B. 72 cm

C. 68 cm

D. 88 cm

**Answer: A**



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4. The perimeter of a rhombus is 40 cm. If the length of one of its diagonals be 12 m, then the length of the other diagonal is

A. 14 cm

B. 15 cm

C. 16 cm

D. 12 cm

**Answer: C**



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5. If the perimeter of a rhombus is  $4a$  and the lengths of the diagonals are  $x$  and  $y$ , then its area is

A.  $a(x + y)$

B.  $x^2 + y^2$

C.  $xy$

D.  $\frac{1}{2}xy$

**Answer: D**



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**6.** If the side of a rhombus is 20 meters and its shorter diagonal is three - fourths of its longer

diagonal, then the area of the rhombus must be

A.  $375 \text{ m}^2$

B.  $380 \text{ m}^2$

C.  $384 \text{ m}^2$

D.  $395 \text{ m}^2$

**Answer: C**



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7. A sheet in the form of a rhombus whose diagonals are 10 m and 8 m. The cost of painting both of its surfaces at the rate of Rs 70 per  $m^2$  is

A. Rs 5600

B. Rs 4000

C. Rs 2800

D. Rs 2000

**Answer: A**



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8. A rhombus and a square have the same base. If the diagonals of the rhombus measure 30 cm and 16 cm respectively, find the area of the square.

A.  $225 \text{ cm}^2$

B.  $200 \text{ cm}^2$

C.  $240 \text{ cm}^2$

D.  $289 \text{ cm}^2$



**Answer: D**



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9. If one of the diagonals of a rhombus is equal to its side, then the diagonals of the rhombus are in the ratio

A.  $\sqrt{3}:1$

B.  $\sqrt{2}:1$

C.  $3:1$

D.  $2:1$

**Answer: A**



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**10.** A rhombus  $OABC$  is drawn inside a circle whose centre is at  $O$  in such a way that the vertices  $A$ ,  $B$  and  $C$  of the rhombus are on the circle. If the area of the rhombus is  $32\sqrt{3}m^2$ , then the radius of the circle is

A. 64 m

B. 8 m

C. 3 m

D. 46 m

**Answer: B**



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**11.** The measure of each of the two opposite angles of a rhombus is  $60^\circ$  and the measure of one of its sides is 10 cm. The length of its smaller diagonal is

A. 10 cm

B.  $10\sqrt{3}$  cm

C.  $10\sqrt{2}$  cm

D.  $\frac{5}{2}\sqrt{2}$  cm

**Answer: A**



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**12.** If the sum of the lengths of the diagonals of a rhombus of side 4 cm is 10 cm, what is its area ?

A.  $8 \text{ cm}^2$

B.  $9 \text{ cm}^2$

C.  $10 \text{ cm}^2$

D.  $12 \text{ cm}^2$

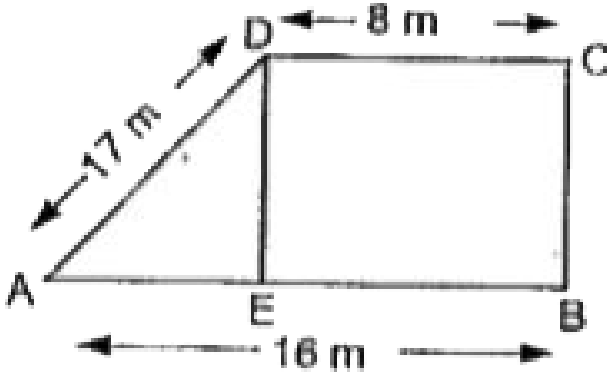
**Answer: B**



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**13.** In the given figure ABCD is trapezium in which the parallel sides AB and CD both are perpendicular to BC. If  $AB = 16 \text{ m}$ ,  $CD = 8 \text{ m}$  and

AD = 17 M. What is the area of the trapezium ?



- A.  $140 \text{ m}^2$
- B.  $168 \text{ m}^2$
- C.  $180 \text{ m}^2$
- D.  $156.4 \text{ m}^2$

**Answer: C**

14. The lengths of the shorter and longer parallel sides of a trapezium are  $x$  cm and  $y$  cm respectively. If the area of the trapezium is  $(x^2 - y^2)$ , then the height of the trapezium is

A.  $x$

B.  $(x + y)$

C.  $y$

D.  $2(x - y)$

**Answer: D**

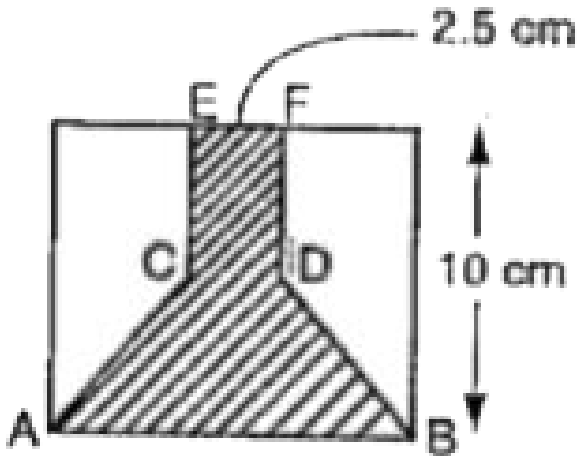


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**15.** In the given figure, the side of the square is 10 cm.  $EF = 2.5$  cm and C and D are half way between the top and bottom sides of the figure. The area of the shaded portion of the



figure is



A.  $43.75\text{cm}^2$

B.  $56.25\text{cm}^2$

C.  $55.25\text{cm}^2$

D.  $50.25\text{cm}^2$

**Answer: A**





**16.** The cross-section of a canal is in the shape of trapezium. The canal is 15 m wide at the top and 9 m wide at the bottom. If the area of the cross-section is  $750 \text{ m}^2$ , then the depth of the canal is

A. 58.4 m

B. 58.6 m

C. 58.8 m

D. 60 m

**Answer: D**



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**17.** The parallel sides of a field in the shape of a trapezium are 20 m and 41 m and the remaining two sides are 10 m and 17 m. Find the cost of levelling the field at the rate of 30 per square meter ?

A. Rs 6400

B. Rs 7320

C. Rs 7500

D. Rs 7000

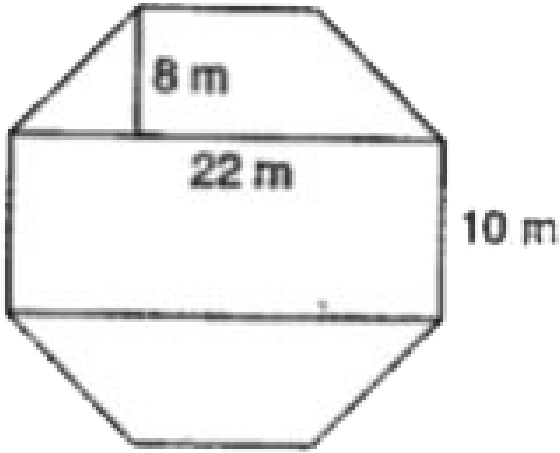
**Answer: B**



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**18.** Top surface of a raised platform is in the shape of a regular octagon as shown in the figure.

Find the area of the octagonal surface.



A.  $400 m^2$

B.  $348 m^2$

C.  $256 m^2$

D.  $476 m^2$

**Answer: D**



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19. The parallel sides of a trapezium are 20 m and 30 m and its non-parallel sides are 6 m and 8 m. Find the area of the trapezium.

A.  $96 \text{ m}^2$

B.  $82 \text{ m}^2$

C.  $100 \text{ m}^2$

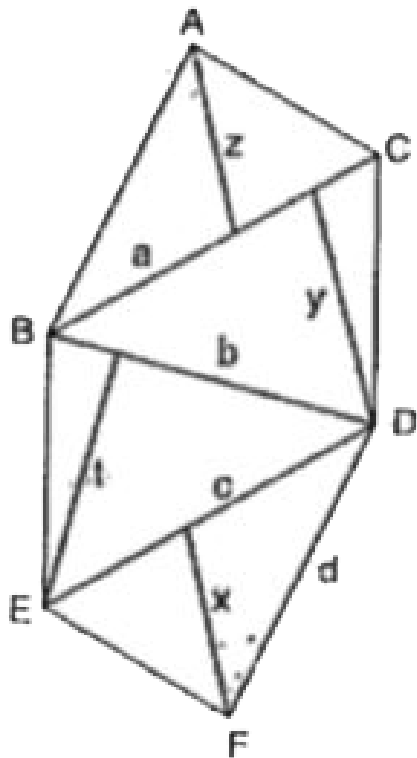
D.  $120 \text{ m}^2$

**Answer: A**



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**20.** What is the area of the plot shown in the figure ?



A.  $\frac{1}{2}(az + by + ct + dx)$

B.  $\frac{1}{2}(bt + cx + ay + az)$

C.  $\frac{1}{2}(cx + bt + by + az)$



$$D. \frac{1}{2}(d + t)(c + x) + \frac{1}{2}(a + b)(y + z)$$

**Answer: B**

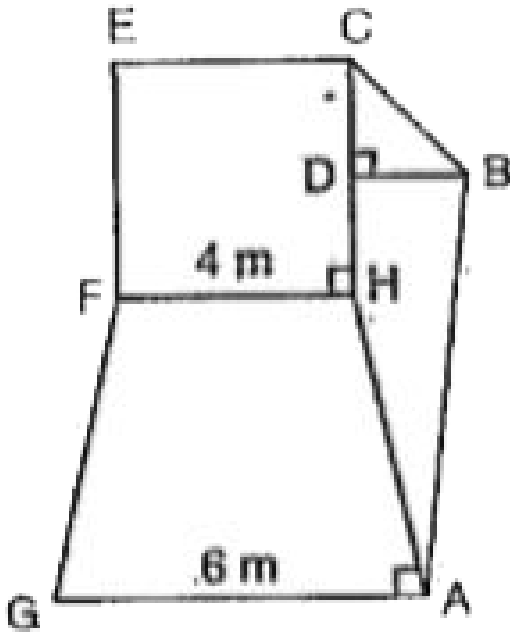


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**21.** The area of the figure ABCEFGA is  $84 \text{ m}^2$ .

AH = HC = AG = 6 m and CE = HF = 4 m. If the angles marked in the figure are  $90^\circ$ , then t he

length of DB will be



A. 2.5 m

B. 5 m

C. 6 m

D. 12 m

**Answer: B**



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**22.** Consider a square of length 3 units. Also consider two points on each side of the square trisecting it into equal parts. The area of the octagon made by these eight points will be

A.  $4 \text{ unit}^2$

B.  $6 \text{ unit}^2$

C.  $7 \text{ unit}^2$

D.  $8 \text{ unit}^2$

**Answer: C**



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**23.** The area of a regular hexagon of side  $2\sqrt{3}$  cm is

A.  $18\sqrt{3} \text{ cm}^2$

B.  $12\sqrt{3} \text{ cm}^2$

C.  $36\sqrt{3}cm^2$

D.  $27\sqrt{3}cm^2$

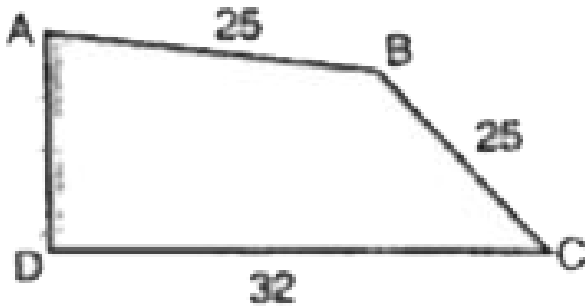
**Answer: A**



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**24.** Two sides of a plot measure 32 m and 24 m and the angle between them a perfect right angle. The other two sides measure 25 m each and the other three angles are not right

angles. What is the area of the plot (in  $m^2$ ) ?



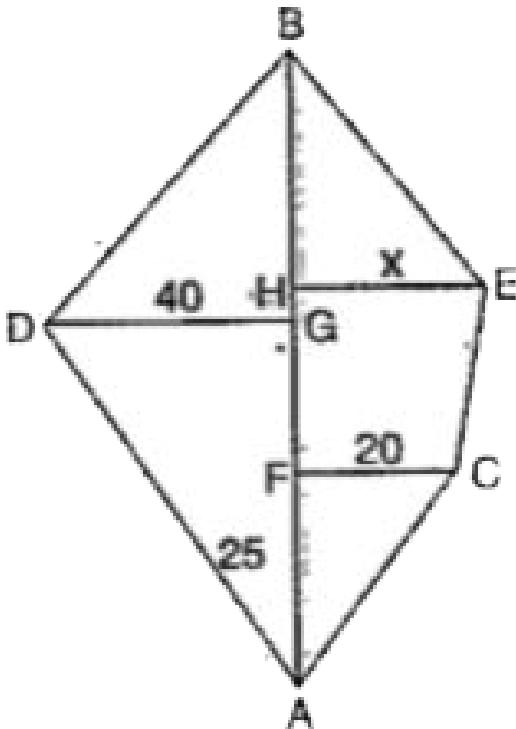
- A. 768
- B. 534
- C. 696.5
- D. 684

**Answer: D**



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25. The area of the given field is  $3500 \text{ m}^2$ .  $AF = 25 \text{ m}$ ,  $AG = 50 \text{ m}$ ,  $AH = 75 \text{ m}$  and  $AB = 100 \text{ m}$ . The rest of the dimensions are shown in the figure. Find the value of  $x$ .



A. 17 m

B. 20 m

C. 22 m

D. 25 m

**Answer: B**



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**Self Assessment Sheet 25 Chapters 25 And 26**



1. A table cover  $4\text{ m} \times 2\text{ m}$  is spread on a meeting table. If  $25\text{ cm}$  of the table cover hanging all around the table, find the cost of polishing the top of the table at Rs  $2.25$  per square meters.

A. 16

B. 12

C. 24

D. 18

**Answer: B**



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2. Find the ratio of the area of a square inscribed in a semi-circle of radius  $r$  to the area of another square inscribed in the entire circle of radius  $r$ .

A. 2:1

B. 3:2

C. 2:5

D. 3:5

**Answer: C**



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**3.** Find the percentage increase in the area of a triangle if its each side is doubled.

A. 50 %

B. 100 %

C. 300 %

D. 150 %

**Answer: C**



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4. Perpendiculars are drawn on the side of an equilateral triangle from any point within the triangle. If the lengths of these perpendiculars be 6 cm, 7 cm and 9 cm, then the length of a side of the triangle is :

A.  $\frac{44}{3} \sqrt{3}$  cm

B.  $\frac{11}{3} \sqrt{3}$  cm

C.  $\frac{22}{3}\sqrt{3}$  cm

D.  $11\sqrt{3}$  cm

**Answer: A**



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5. A rhombus has an area equal to one-fifth the sum of the areas of the squares built on its four sides. The ratio of the long diagonal to the short diagonal is:

A.  $2 + \sqrt{3}$

B.  $2 - \sqrt{3}$

C.  $\frac{1}{2}$

D. 2

**Answer: D**



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6. In a rectangle, the difference between the sum of the adjacent sides and the diagonal is

half the length of the longer side. What is the ratio of the shorter side to the longer side?

A.  $\sqrt{3} : \sqrt{2}$

B.  $1 : \sqrt{3}$

C.  $2 : 5$

D.  $3 : 4$

**Answer: D**



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7. The parallel sides of a trapezium are 20 cm and 10 cm. Its non-parallel sides are both equal, each being 13 cm. Find the area of the trapezium?

A.  $120 \text{ cm}^2$

B.  $180 \text{ cm}^2$

C.  $210 \text{ cm}^2$

D.  $150 \text{ cm}^2$

**Answer: B**



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8. A square and a regular hexagon have equal perimeters. Their areas are in the ratio:

A.  $2:1$

B.  $2\sqrt{3}:1$

C.  $\sqrt{3}:2$

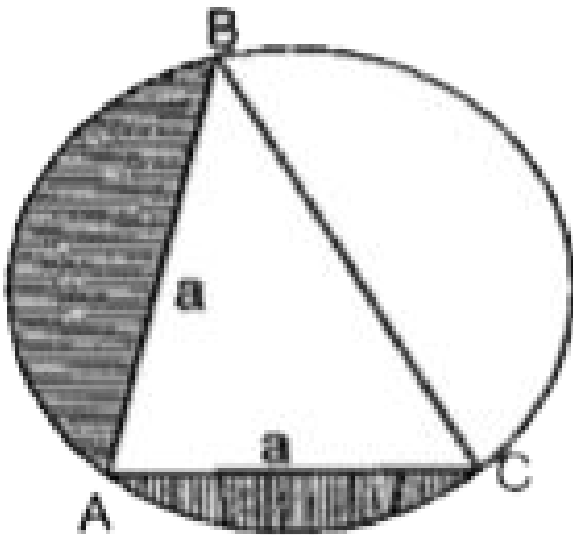
D.  $3:2$

**Answer: C**



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9. If BC passes through the centre of the circle, then area of the shaded region in the given figure is :



A.  $\frac{a^2}{2}(3 - x)$

B.  $a^2(\pi/2 - 1)$

C.  $2a^2(\pi - 1)$

D.  $\frac{a^2}{2}(\pi/2 - 1)$

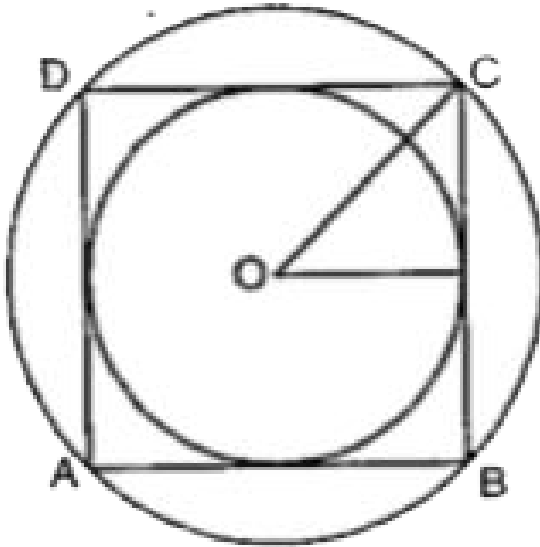
**Answer: D**



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**10.** If the area of region bounded by the inscribed and circumscribed circles of a square

is  $9\pi$ , then the area of the square will be :



A.  $6\pi$

B.  $5\pi$

C. 25

D. 36

**Answer: D**



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