



## MATHS

### BOOKS - NAGEEN MATHS (HINGLISH)

#### HERONS'S FORMULA

#### Solved Examples

1. Find the area of a triangle whose sides are  $17\text{cm}$ ,  $8\text{cm}$  and  $15\text{cm}$  long.

- A.  $75\text{cm}^2$
- B.  $60\text{cm}^2$
- C.  $45\text{cm}^2$
- D.  $120\text{cm}^2$

**Answer: B**



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2. Find the area of a triangle whose sides are  $20\text{cm}$ ,  $34\text{cm}$  and  $42\text{cm}$ .

Hence find the height corresponding to the longest side.

A.  $16\text{ cm}$

B.  $15\text{ cm}$

C.  $14\text{ cm}$

D.  $13\text{ cm}$

**Answer: A**



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3. The lengths of the sides of a triangle are in the ratio  $4:5:3$  and its perimeter is  $96\text{cm}$ . Find its area.

A.  $300\text{ cm}^2$

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

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

D.  $364 \text{ cm}^2$

**Answer: C**



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4. The base of an isosceles triangle is  $12 \text{ cm}$  and its area is  $48 \text{ cm}^2$ . Find the equal sides of the triangle.

A.  $14 \text{ cm}$

B.  $10 \text{ cm}$

C.  $8 \text{ cm}$

D.  $12 \text{ cm}$

**Answer: B**



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5. Find the area of a triangular field, the length of whose sides are  $275m$ ,  $660m$  and  $715m$ . What is the cost of cultivating the field at the rate of  $Rs. 200$  per hectare ?

A.  $Rs. 1800$

B.  $Rs. 1678$

C.  $Rs. 1675$

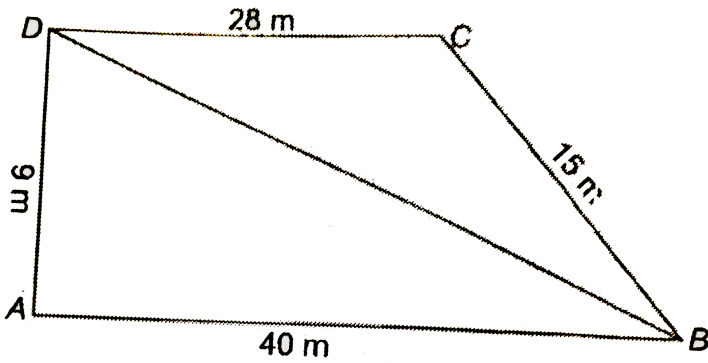
D.  $Rs. 1815$

**Answer: D**



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6. Figure ,  $ABCD$  is a field in the form of a quadrilateral whose sides are indicated in the figure. If  $\angle DAB = 90^\circ$  , find the area of the field.



- A. 302
- B. 304
- C. 306
- D. 307

Answer: C

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7. The area of trapezium field whose parallel sides are  $25\text{cm}$ ,  $13\text{cm}$  and other sides are  $15\text{cm}$  and  $15\text{cm}$ .

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8. Kamla has a triangular field with sides  $240m$ ,  $200m$ ,  $360m$ , where she grew wheat. In another triangular field with sides  $240m$ ,  $320m$ ,  $400m$ , adjacent to the previous field, she wanted to grow potatoes and onions as shown in figure. She divided the field in two parts by joining the mid-point of the longest side to the opposite vertex and grew potatoes in one part and onions in the other part. How much area (in hectares) has been used for wheat, potatoes and onions ? ( $1\text{hectare} = 10000\text{ m}^2$ )



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9. A rhombus -shaped field has green grass for 18 cows to graze. If each side of the rhombus is  $30\text{ m}$  and its longer diagonal is  $48\text{ m}$ , how much area of grass field will each cow be getting ?

A.  $46m^2$

B.  $48m^2$

C.  $45m^2$

D.  $50m^2$

**Answer: B**



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10.  $ABCD$  is a rectangle with  $AB = 16$  units and  $BC = 12$  units.  $F$  is a point on  $AB$  and  $E$  is a point on  $CD$  such that  $AFCE$  is a rhombus.

Find the length of  $EF$ .

A. 15 units

B. 16 units

C. 17 units

D. 18 units

**Answer: A**



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1. A traffic signal board, indicating 'SCHOOL AHEAD', is an equilateral triangle with side  $a$ . Find the area of the signal board, using Heron's formula. If its perimeter is 180 cm, what will be the area of the signal board?

A.  $900\sqrt{3}cm^2$

B.  $800\sqrt{3}cm^2$

C.  $950\sqrt{3}cm^2$

D.  $400\sqrt{3}cm^2$

**Answer: A**

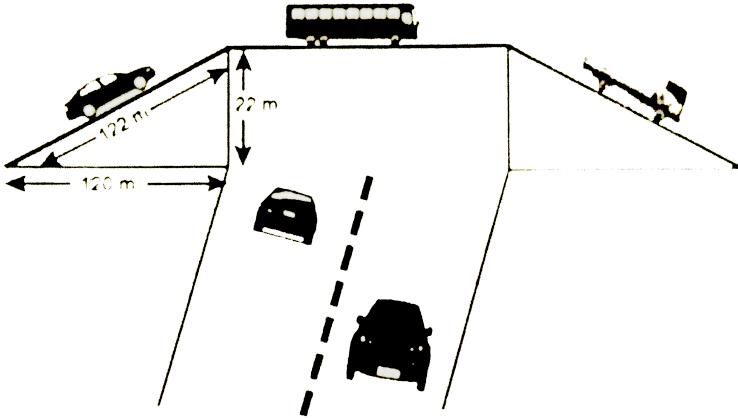


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2. This triangular side walls of a flyover have been used for advertisements. This sides of the walls are  $122m$ ,  $22m$  and  $120m$  (see



figure). The advertisements yield an earning of  $Rs. 500$  per  $m^2$  per year. A company hired one of its walls for 3 months. How much rent did it pay ?



- A.  $Rs. 16, 50, 000$
- B.  $Rs. 16, 00, 000$
- C.  $Rs. 16, 80, 000$
- D.  $Rs. 16, 65, 000$

**Answer: A**



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3. Radha made a picture of an aeroplane with coloured paper as shown in figure. Find the total area of the paper used.



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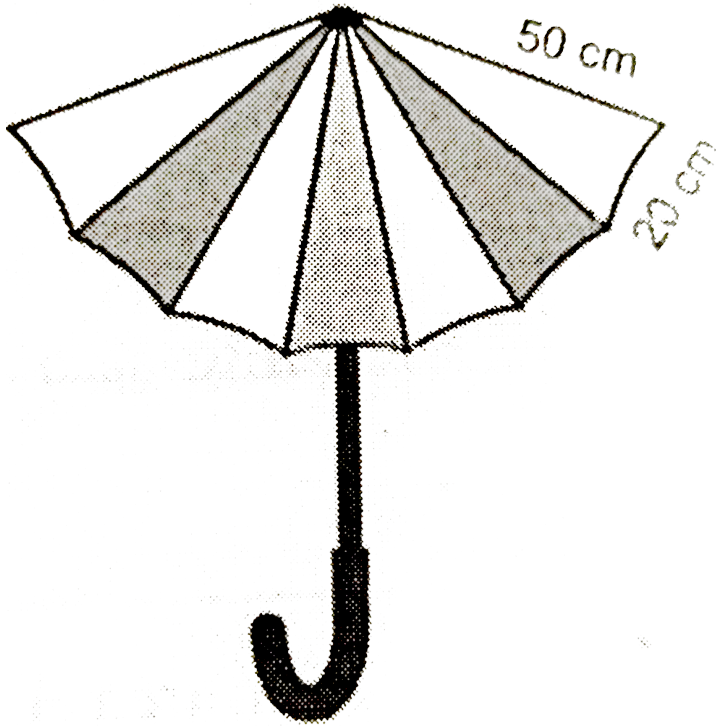
4. A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are  $26\text{cm}$ ,  $28\text{cm}$  and  $30\text{cm}$ , and the parallelogram stands on the base  $28\text{cm}$ , find the height of the parallelogram.



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5. An umbrella is made by stitching 10 triangular pieces of cloth of two different colors (see figure), each piece measuring  $20\text{cm}$ ,  $50\text{cm}$  and

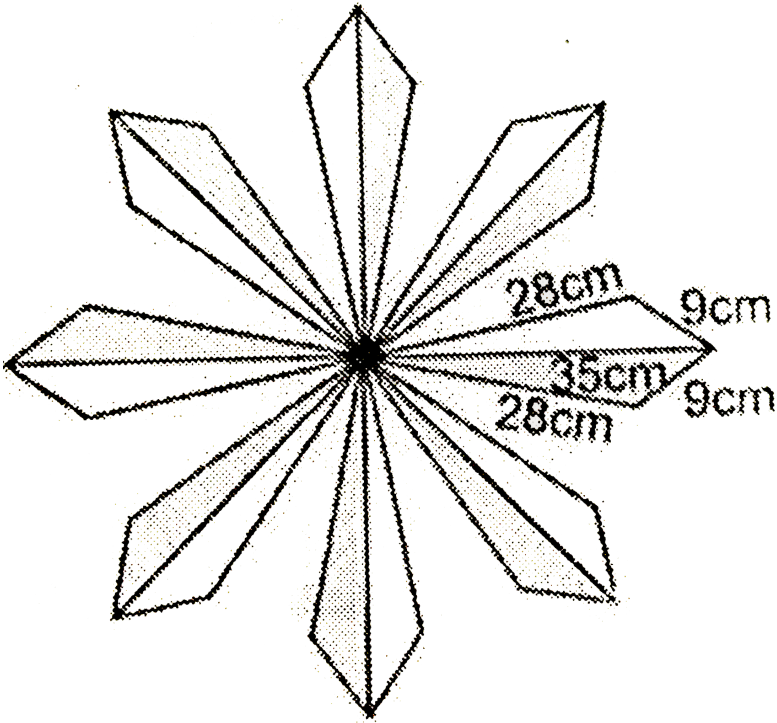
50cm. How much cloth of each colour is required for the umbrella ?



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6. A floral design on a floor is made up of 16 tiles which are triangular, the sides of the triangle being  $9\text{cm}$ ,  $28\text{cm}$  and  $35\text{cm}$  (See figure). Find the

cost polishing the tiles at the rate of 50 paise per  $cm^2$ .



A. Rs. 790.60

B. Rs. 705.60

C. Rs. 675.60

D. Rs. 780.60

**Answer: B**



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7. The triangular side walls of a flyover have been used for advertisements. The sides of the walls are  $13m$ ,  $14m$  and  $15m$ . The advertisement yield an earning of Rs. 2000 per  $m^2$  a year. A company hired one of its walls for 6 months. How much rent did it pay ?

- A. Rs. 82, 000
- B. Rs. 83, 000
- C. Rs. 84, 000
- D. Rs. 85, 000

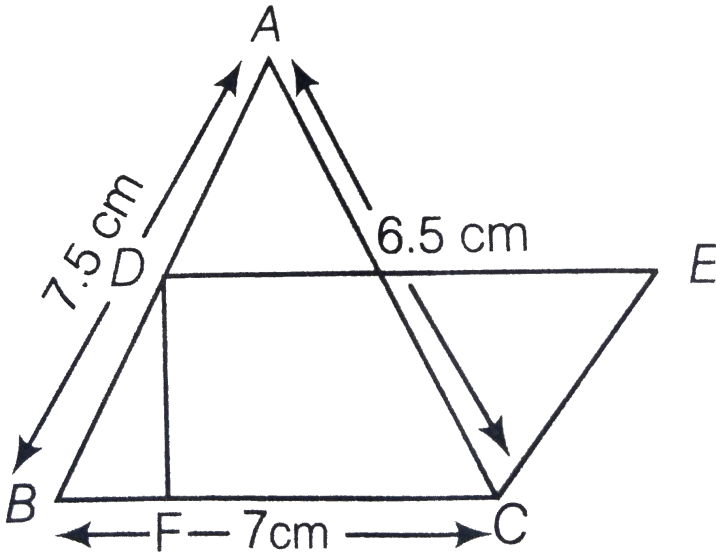
**Answer: C**

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8. How much paper of each shade is needed to make a kite given in the figure, in which  $ABCD$  is a square with diagonal  $44cm$

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9. In figure,  $\triangle ABC$  has sides  $AB = 7.5\text{cm}$ ,  $AC = 6.5\text{cm}$  and  $BC = 7\text{cm}$ . On base  $BC$  a parallelogram  $DBCE$  of same area as that of  $\triangle ABC$  is constructed. Find the height  $DF$  of the parallelogram.



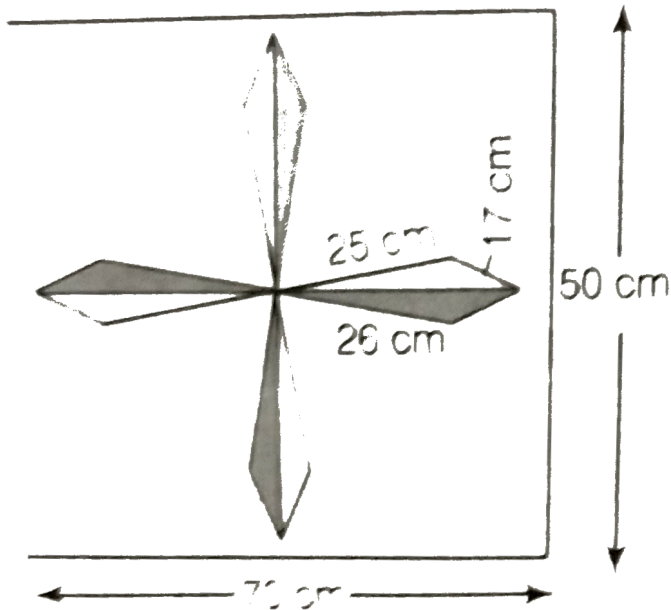
- A. 3 cm
- B. 7 cm
- C. 5 cm
- D. 6 cm

**Answer: A**



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10. A design is made on a rectangular tile of dimensions  $50\text{ cm} \times 17\text{ cm}$  as shown in figure. The design shows 8 triangles, each of sides  $26\text{ cm}$ ,  $17\text{ cm}$  and  $25\text{ cm}$ . Find the total area of the design and the remaining area of the tiles.



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## Exercise 12a

1. Find the area of a triangle whose sides are  $12\text{cm}$ ,  $16\text{cm}$  and  $20\text{cm}$ .

A.  $102\text{cm}^2$

B.  $100\text{cm}^2$

C.  $98\text{cm}^2$

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

**Answer: D**



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2. Find the area of a triangle whose sides are  $18\text{cm}$ ,  $24\text{cm}$  and  $30\text{cm}$ .

Also find the length of altitude corresponding to the largest side of the triangle.



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3. Find the area of an equilateral triangle whose side is  $a$  cm.

A.  $\frac{\sqrt{3}}{4}a^2$  cm<sup>2</sup>

B.  $\frac{\sqrt{2}}{4}a^2$  cm<sup>2</sup>

C.  $\frac{\sqrt{3}}{5}a^2$  cm<sup>2</sup>

D.  $\frac{\sqrt{2}}{5}a^2$  cm<sup>2</sup>

**Answer: A**



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4. The lengths of the sides of a triangle are in the ratio 3 : 4 : 5. Find the area of the triangle if its perimeter is 144 cm.



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5. The area of an equilateral triangle is numerically equal to its perimeter. Find the length of its side correct to two decimal place.



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6. The perimeter of an isosceles triangle is 40 cm. The base is two-third of the sum of equal sides. Find the area of the triangle .



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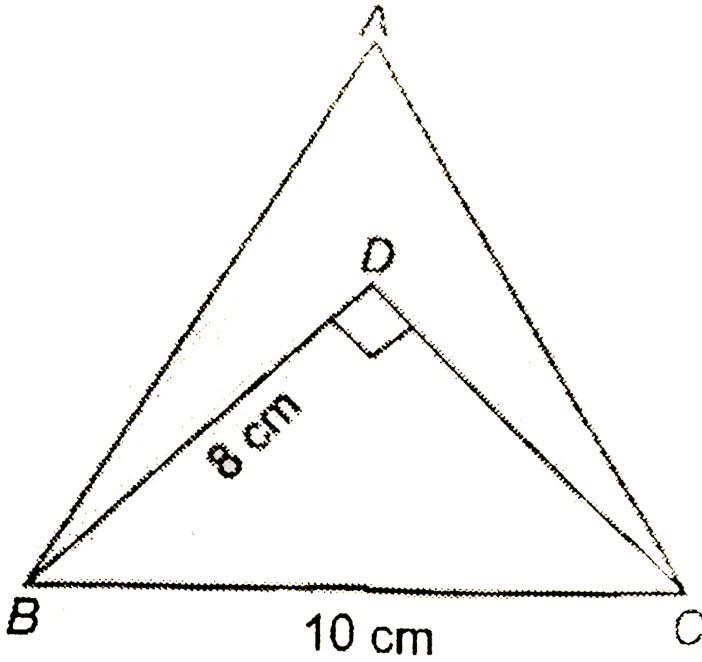
7. Find the percentage increase in the area of a triangle if its each side is doubled.



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8. The given figure shows an equilateral triangle  $ABC$  whose side is 10 cm and a right-angled  $BDC$  inside it, whose side  $BD = 8\text{cm}$  and

$\angle D = 90^\circ$ . Find the area of the shaded portion.



- A.  $17.3\text{cm}^2$
- B.  $16.3\text{cm}^2$
- C.  $18.3\text{cm}^2$
- D.  $19.3\text{cm}^2$

**Answer: D**

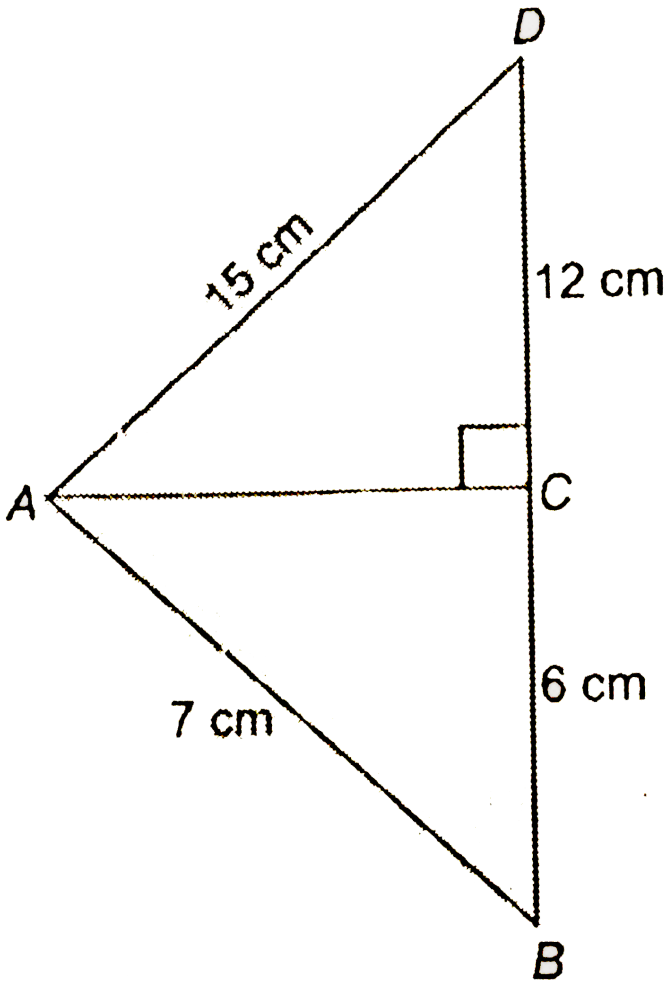


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9. In the given figure  $\angle ACD = 90^\circ$

$AD = 15\text{ cm}$ ,  $DC = 12\text{ cm}$ ,  $AB = 7\text{ cm}$  and  $BC = 6\text{ cm}$ .

Find the area of the shaded region.





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10. The side of an equilateral triangle is  $6\sqrt{3}$  cm. Find the area of the triangle. [Take  $\sqrt{3} = 1.732$ ]



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11. Find the area of a triangular field whose equal sides are 17 m, 15 m, and 8 m respectively . If a labour can plough  $12m^2$  field in 1 day and gets Rs. 600 per day. Find the total labour charge he received for ploughing the field .



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## Exercise 12b

1. Find the area of a quadrilateral one of whose diagonal, is 25 cm long and the perpendicular from the other two vertices to this diagonal are 10

cm and 12 cm.

A.  $285\text{cm}^2$

B.  $280\text{cm}^2$

C.  $275\text{cm}^2$

D.  $270\text{cm}^2$

**Answer: C**



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2. The side of a rhombus is 15 cm. If its one diagonal is 18 cm. Find its area.

A.  $216\text{cm}^2$

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

C.  $316\text{cm}^2$

D.  $300\text{cm}^2$

**Answer: A**



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3. Two adjacent sides of a parallelogram are 10 cm and 12 cm. If its one diagonal is 14 cm long, find the area of the parallelogram.

A.  $40\sqrt{3}cm^2$

B.  $49\sqrt{3}cm^2$

C.  $48\sqrt{6}cm^2$

D.  $58\sqrt{6}cm^2$

**Answer: C**



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4. The perimeter of a rhombus is 52 cm. If its one diagonal is 10 cm, find using Heron's formula the area of rhombus.

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

B.  $130\text{cm}^2$

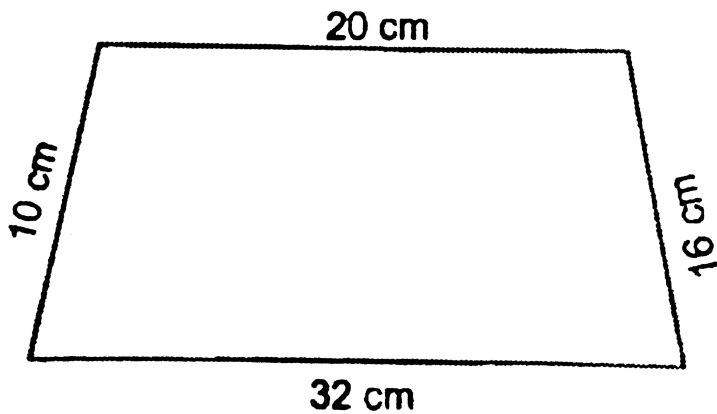
C.  $140\text{cm}^2$

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

Answer: A

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5. Find the area of the given trapezium.



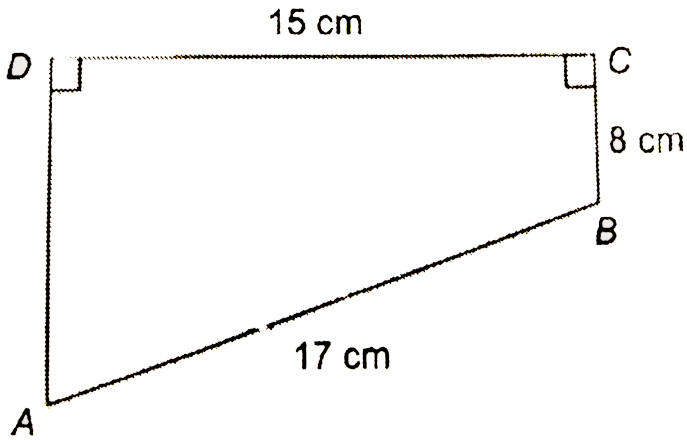
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6. Find the area of quadrilateral ABCD in which  $\angle B = 90^\circ$ ,  $BC = 32$  cm,  $AB = 24$  cm and  $CD = DA = 25$  cm.

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7. The given figure shows a trapezium ABCD in which  $AB = 17$  cm,  $BC = 8$  cm and  $CD = 15$  cm. Find the area of the trapezium.



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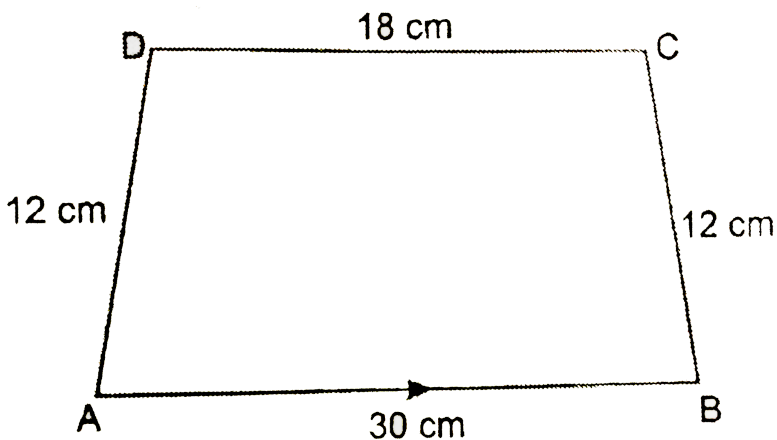
8. Calculate the area of quadrilateral ABCD in which  $\angle = 90^\circ$ , triangle BCD is an equilateral triangle of side 24 cm and  $AD = 26$  cm.

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9. One side of a parallelogram is 10 cm. If its diagonals are 12 cm and 16 cm. Find the area of the parallelogram.

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10. The given figure shows a metal plate in the form of a trapezium. Calculate the area of the plate in sq. cm correct to one decimal place.





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## Revision Exercise

1. The lengths of the three sides of a  $\triangle$  are 3, 4 and 5 cm, respectively.

Find its area.

A.  $7 \text{ cm}^2$

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

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

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

**Answer: B**



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2. Each side of an equilateral triangle measure 10 cm. Find the area of the triangle .



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3. The base of an isosceles triangle is 16 cm. If both the equal sides be 17 cm each, find the area of the triangle.

A.  $90 \text{ cm}^2$

B.  $100 \text{ cm}^2$

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

D.  $110 \text{ cm}^2$

**Answer: C**



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4. The sides of a triangle are in the ratio 5 : 12 : 13 and its perimeter is 150 cm. Find the area of the triangle.



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5. Calculate the area of an equilateral triangle whose height is 20 cm.



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6. Find the area of triangle whose sides are  $17\text{cm}$ ,  $8\text{cm}$  and  $15\text{cm}$ . Also calculate the length of the altitude corresponding to the largest side of the triangle.

A.  $80\text{cm}^2$ ,  $7.06\text{cm}$

B.  $50\text{cm}^2$ ,  $9.06\text{cm}$

C.  $90\text{cm}^2$ ,  $7.06\text{cm}$

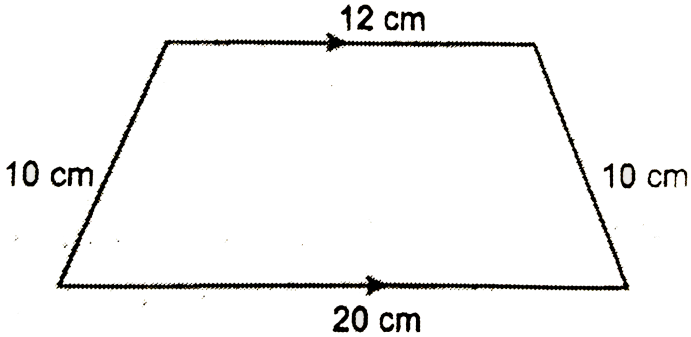
D.  $60\text{cm}^2$ ,  $7.06\text{cm}$

**Answer: D**



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7. Find the area of the trapezium given in adjoining figure.



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8. A park is in the shape of quadrilateral ABCD in which  $AB = 9\text{cm}$ ,  $BC = 12\text{cm}$ ,  $CD = 5\text{cm}$ ,  $AD = 8\text{cm}$  and  $\angle C = 90^\circ$ . Find the area of the park.

A.  $65.4\text{cm}^2$

B.  $69.4\text{cm}^2$

C.  $66.4\text{cm}^2$

D.  $68.4\text{cm}^2$

**Answer: A**



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9. Find the area of a parallelogram ABCD in which  $AB = 8$  cm,  $BC = 15$  cm and diagonal  $AC = 17$  cm.

A.  $220\text{cm}^2$

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

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

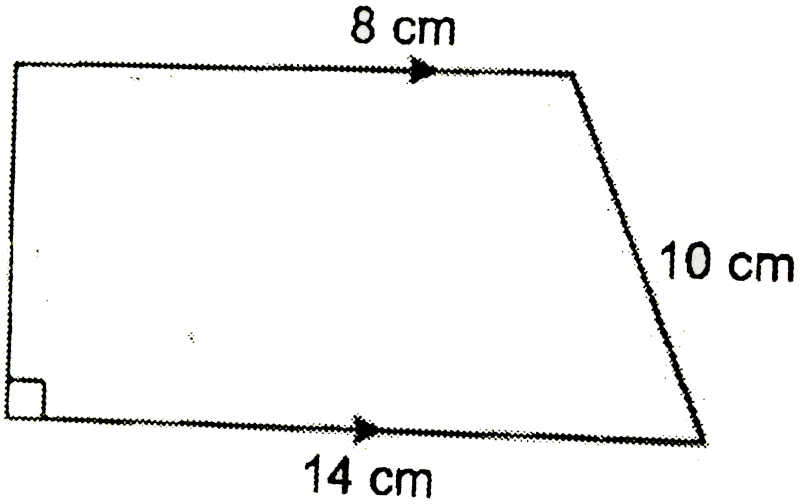
D.  $175\text{cm}^2$

**Answer: C**



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10. Find the area of the trapezium given in given figure.



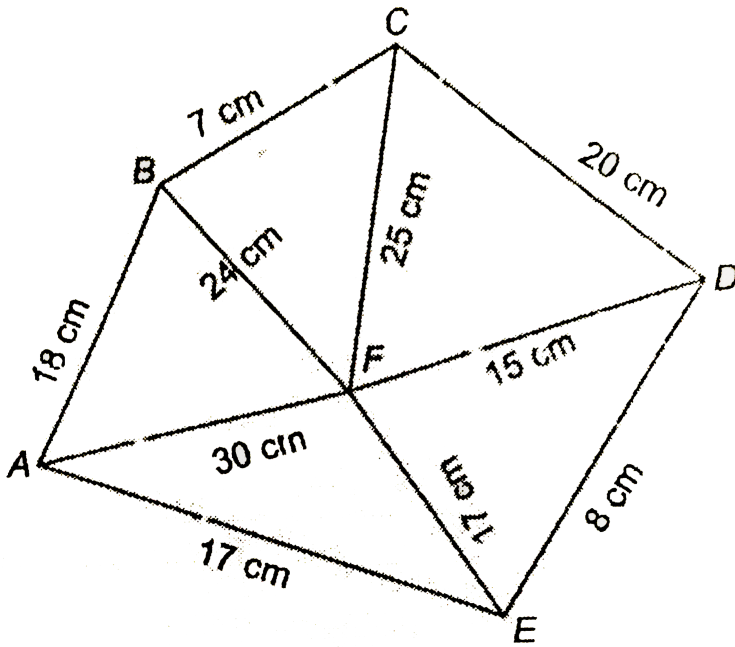
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11. Find the area of the given figure

Given



$AB = 18\text{cm}$ ,  $BC = 7\text{cm}$ ,  $CD = 20\text{cm}$ ,  $DE = 8\text{cm}$ ,  $EA = 17\text{cm}$ ,  $AF = 30$



- A.  $610\text{sq. cm.}$
- B.  $640\text{sq. cm.}$
- C.  $630\text{sq. cm.}$
- D.  $650\text{sq. cm.}$

**Answer: C**



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