MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

AREAS OF TRIANGLES AND QUADRILATERALS

Solved Examples

1. Find the area of a triangle having base 25 cm and height 10.8 cm .

A. 115 cm^2

B. 125 cm^2

C. 135 cm^2

D. 145 cm^2

Answer: C

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2. Find the perimeter and area of a triangle whose sides are of lengths 52 cm, 56 cm and 60 cm respectively.

A. 1344 cm^2

B. 1444 cm^2

C. 1544 cm^2

D. 1644 cm^2

Answer: A

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3. The lengths of the sides of a triangle are in the ration 3:4:5 and its perimeter is $144cm$. Find the area of the triangle and the height corresponding to the longest side.

A. 26.8 cm

B. 24.8 cm

C. 18.8 cm

D. 28.8 cm

Answer: D

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4. The sides of a triangle are 35 cm, 54 cm and 61 cm respectively. Find the length of its longest altitude.

A. $24\sqrt{2}$ cm

B. $24\sqrt{5}$ cm

C. $24\sqrt{3}$ cm

D. $24\sqrt{7}$ cm

Answer: B

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5. The perimeter of an equilateral triangle is 60 cm. Find its (i) area and (ii) height. (Given, $\sqrt{3} = 1732.$)

A. 17.32 cm

B. 12.32 cm

C. 14.32 cm

D. 16.32 cm

Answer: A

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6. The height of an equilateral triangle is 6 cm. Its area is

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7. From a point in the interior of an equilateral triangle, perpendiculars are drawn on the three sides. The lengths of the perpendiculars are 14 cm, 10 cm and 6 cm. Find the area of the triangle.

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8. Find the area of an isosceles triangle having each of whose equal sides is 13 cm and whose base is 24 cm.

A. 60 cm^2

B. 70 cm^2

C. 80 cm^2

D. 90 cm^2

Answer: A

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9. The base of an isosceles triangle measures 24 cm and its area is $192cm^2$, Find its perimeter.

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10. The difference between the sides at right angles in a right - angled triangle is 14 cm .

The area of the trangle is $120cm^2$. Calculate the perimeter of the triangle.

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11. Find the area of the shaded region given in figure

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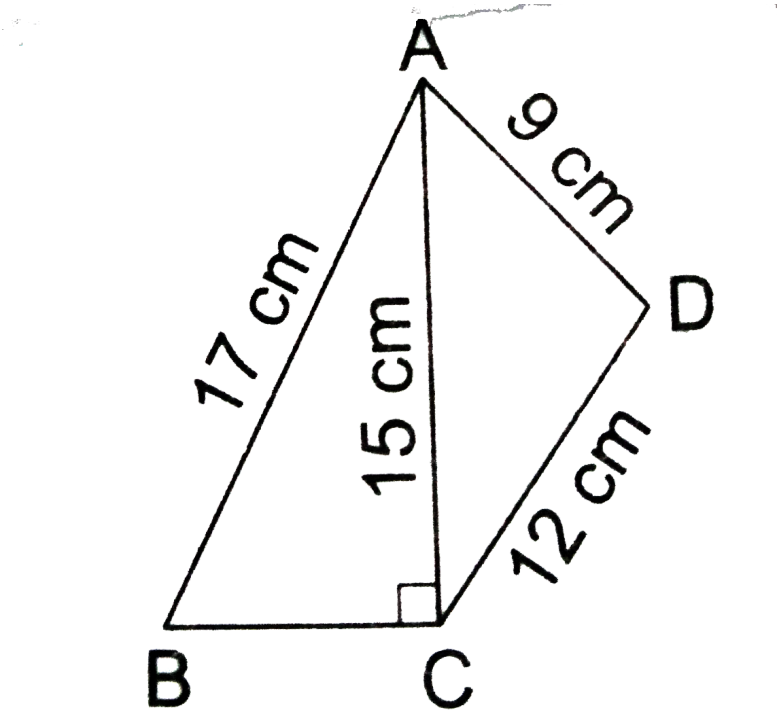
12. Find the perimeter and area of the quadrilateral ABCD in which AB= 17 cm ,

$AD = 9cm, CD = 12cm \angle AVB = 90^\circ$ and

AC=15 cm.



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13. In a four sider- field , the length of the longer diagonal is 128 m. the lengths of perpendiculars from the opposite vertices upon this diagonal are 22.7 m and 17.3 and Find the area of the field.

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14. Find the area of the quadrilateral ABCD in which AB = 9 m, BC = 40 m, $\angle ABC = 90^\circ$, CD = 15 m and AD = 28 m.

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15. A piece of land is in the shape of a rhombus whose perimeter is 400 m and one of its diagonals is 160 m. Find the area of the land.

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16. The adjacent sides of a parallelogram are 36 cm and 27 cm is length. If the distance between the shorter sides is 12 cm, find the distance between the longer sides.

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17. The diagonals of a rhombus are 48 cm and 20 cm long. Find (i) the area of the rhombus and (ii) the perimeter of the rhombus.

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18. Find the area of the given trapezium PQRS in which RQ || SP and PQ $\perp$ SP such that RQ = 7m, RS = 13 m and SP = 12 m.

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19. A field is in the shape of a trapezium whose parallel sides are 25m and 10m. If its non-parallel sides are 14m and 13m, find its area.

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20. If each sides of a triangle is doubled then find the ratio of the area of the new triangle thus formed and the given triangle.

A. $4:1$

B. $5:1$

C. $6:1$

D. $7:1$

Answer: A

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21. The length and breadth of a rectangular park are in the ratio 8 : 5. A path, 1.5 m wide, running all around the outside of the park has

an area of $594m^2$. Find the dimensions of the park.

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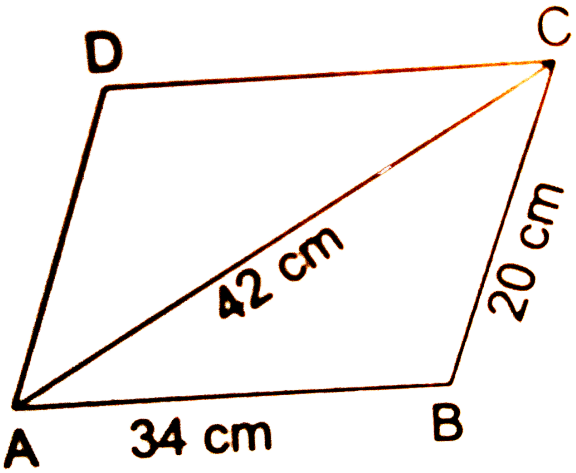
Example

1. The adjacent sides of a parallelogram ABCD are AB = 34 cm, BC = 20 cm and diagonal AC =

42 cm. Find the area of the parallelogram.



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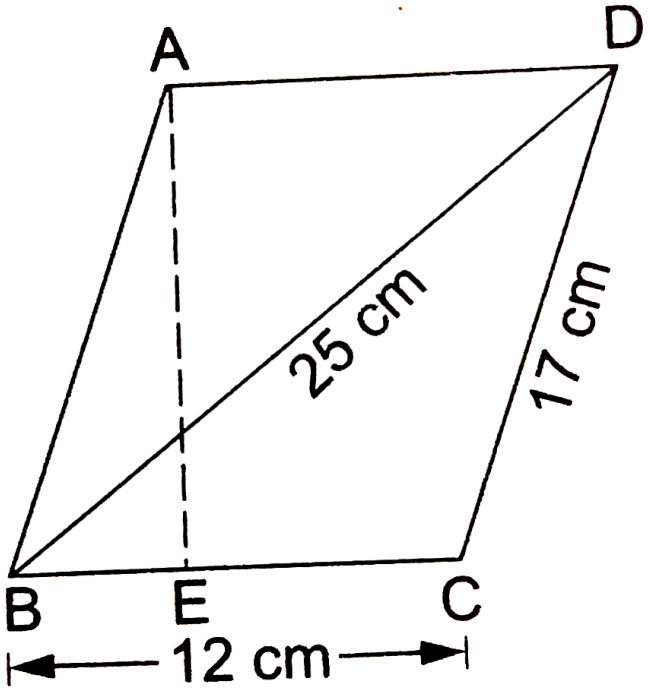
2. Find the area of the parallelogram ABCD in which BC = 12 cm, CD = 17 cm and BD = 25 cm. Also, find the length of the altitude AE from

vertex A on the side BC.



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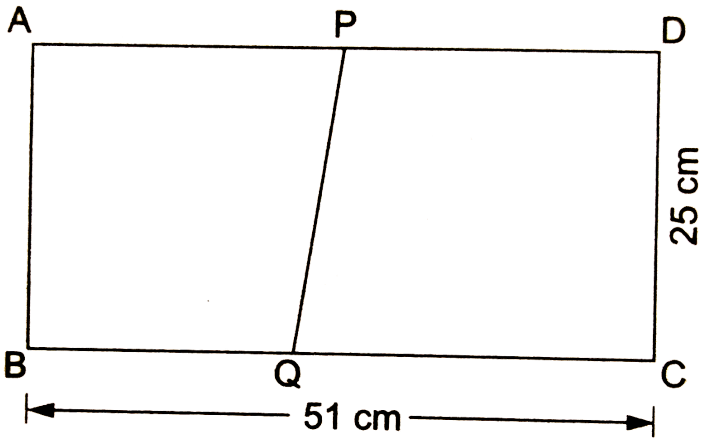
3. In the given figure, ABCD is a rectangle of length 51 cm and bredth 25 cm. A trapezium

PQCD with its parallel sides QC and PD in the ratio 9 : 8 is cut off from the rectangle, as shown in the figure. If the area of the trapezium PQCD is $\frac{5}{6}$th part of the area of the rectangle, find the lengths QC and PD.



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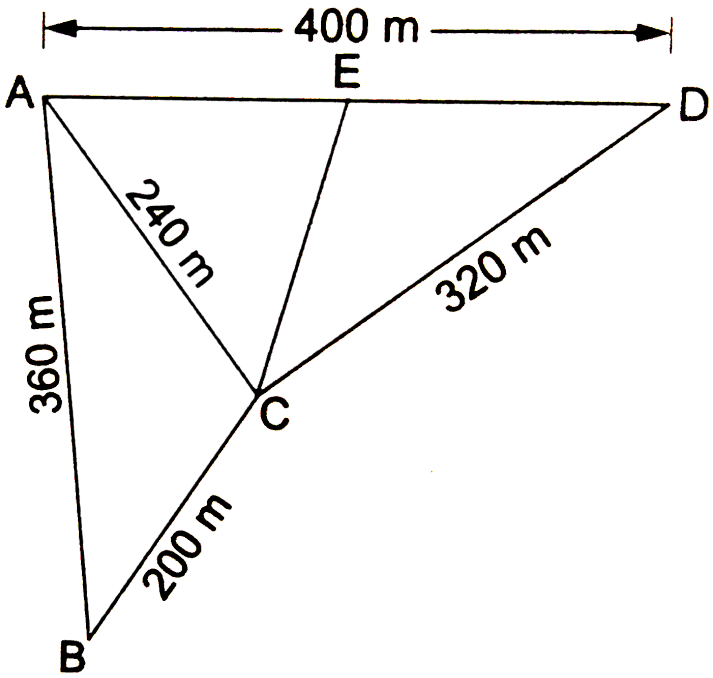
4. A farmer has a triangular field with sides 360 m, 200 m and 240 m, where he grows wheat. Adjacent to this field, he has another triangular field with sides 240 m, 320 m and 400 m, divided into two parts by joining the midpoint of the longest side to the opposite vertex. He grows potatoes in one part and onions in the other part. How much area (in hectares) has been used for wheat, potatoes

and onions ? (1 hectare = $10000m^2$.)



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5. 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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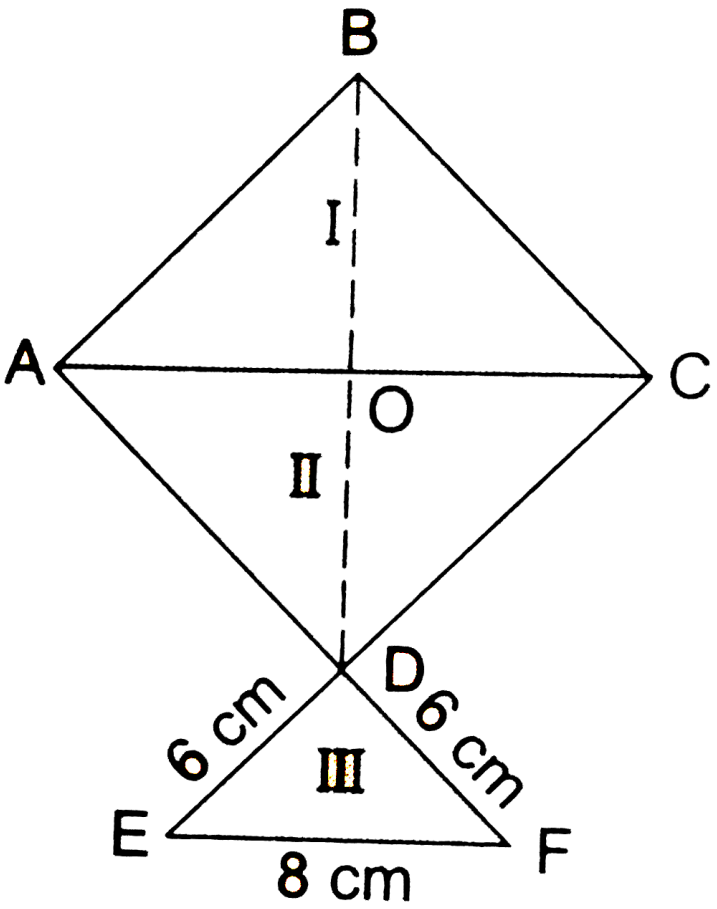
6. A kite in the shape of a square with a diagonal 32 cm and an isosceles triangle of base 8 cm and sides 6 cm each is to be made of three different shades as shown in the figure. How much paper of each shade has

been used in it ?



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Exercise 14

1. Find the area of the triangle whose base measures 24 cm and the corresponding height measures 14.5 cm.

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2. The base of a triangular field is three times its altitude. If the cost of sowing the field at Rs. 58 per hectare is Rs. 783, Find its base and height.

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3. Find the area of the triangle whose sides are 42 cm, 34 cm and 20 cm in length. Hence, find the height corresponding to the longest side.

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4. Calculate the area of the triangle whose sides are 18 cm, 24 cm and 30 cm in length. Also, find the length of the altitude corresponding to the smallest side.

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5. Find the area of a triangular field whose sides are 91 m, 98 m and 105 m in length. Find the height corresponding to the longest side.

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

A. 450 m^2

B. 750 m^2

C. 650 m^2

D. 550 m^2

Answer: B

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7. The perimeter of a triangular field is 540 m and its sides are in the ratio 25 : 17 : 12. Find

the the area of the field. Also, find the cost of ploughing the field at Rs. 5 per m^2.

A. 900 m^2 Rs. 45000

B. 45000 m^2 Rs. 9000

C. 9500 m^2 Rs. 45000

D. 9000 m^2 Rs. 45000

Answer: D

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8. Two sides of a triangular field are 85 m and 154 m in length and its perimeter is 324 m. Find (i) the area of the field and (ii) the length of the perpendicular from the opposite vertex on the side measuring 154 m.

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9. Find the area of an isosceles triangle each of whose equal sides measures 13 cm and whose base measures 20 cm.

A. 53.06 cm^2

B. 63.06 cm^2

C. 83.06 cm^2

D. 73.06 cm^2

Answer: C

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10. The base of an isosceles triangle measures 80 cm and its area is 360 cm^2. Find the perimeter of the triangle.

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11. The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3 : 2. Find the area of the triangle.

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12. The perimeter of a triangle is 50 cm. One side of the triangle is 4 cm longer than the smaller side and the third side is 6 cm less

than twice the smaller side. Find the area of the triangle.

A. $20\sqrt{30}cm^2$

B. $30\sqrt{30}cm^2$

C. $40\sqrt{30}cm^2$

D. $50\sqrt{30}cm^2$

Answer: A

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

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14. The perimeter of an isosceles triangle is 42 cm and its base is $1\frac{1}{2}$ times each of the equal

sides. Find (i) the length of each side of the triangle, (ii) the area of the triangle, and (iii) the height of the triangle. (Given, $\sqrt{7} = 2.64$.)

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15. The area of an equilateral triangle is $36\sqrt{3}cm^2$. Its perimeter is

A. 66 cm

B. 56 cm

C. 36 cm

D. 46 cm

Answer: C

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16. If the area of an equilateral triangle is $81\sqrt{3}cm^2$, find its height.

A. $9\sqrt{3}cm$

B. $10\sqrt{3}cm$

C. $8\sqrt{3}cm$

D. $11\sqrt{3}cm$

Answer: A

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17. Each side of an equilateral triangle measures 8 cm. Find (i) the area of the triangle, correct to 2 places of decimal and (ii) the height of the triangle, correct to 2 places of decimal. (Take $\sqrt{3} = 1.732$.)

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18. The height of an equilateral triangle measures 9 cm. Find its area, correct to 2 places of decimal. (Take $\sqrt{3} = 1.732$.)

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19. The base of a right-angled triangle measures 48 cm and its hypotenuse measures 50 cm. Find the area of the triangle.

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20. The sides of a quadrilateral ABCD taken in order are 6 cm, 8 cm, 12 cm and 14 cm respectively and the angle between the first two sides is a right angle. Find its area. (Given, $\sqrt{6} = 2.45$.)

A. 82.8 cm^2

B. 84.8 cm^2

C. 81.8 cm^2

D. 86.8 cm^2

Answer: A

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21. The area of a trapezium is 475 cm^2 and its height is 19 cm. Find the lengths of its two parallel sides if one side is 4 cm greater than the other.

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22. A field is in the shape of a trapezium having parallel sides 90 m and 30 m. These

sides meet the thired side at right angles. The length of the fourth side is 100 m. If it costs Rs. 5 to plough 1 m^2 of the field, find the total cost of ploughing the field.

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23. A rectangular plot is given for constructing a house, having a measurement of 40 m long and 15 m in the front. According to the laws, a minimum of 3-m-wide space should be left in the front and back each and 2 m wide space

on each of the other sides. Find the largest area where house can be constructed.

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24. A rhombus-shaped sheet with perimerter 40 cm and on e diagonal 12 cm, is painted on both sides at the rate of Rs. 5 per cm^2. Find the cost of painting.

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25. The difference between the semi perimeter and the sides of a ΔABC and 8 cm, 7 cm and 5 cm respectively. Find the area of the triangle.

A. $40\sqrt{14}cm^2$

B. $30\sqrt{14}cm^2$

C. $10\sqrt{14}cm^2$

D. $20\sqrt{14}cm^2$

Answer: D

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26. The shape of the cross section of a canal is a trapezium. If the canal is 10 m wide at the top, 6 m wide at the bottom and the area of its cross section is 640 m^2, find the depth of the canal.

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27. Find the area of a trapezium parallel sides are 11 cm and 25 cm long and nonparallel sides are 15 cm and 13 cm .

A. 216 m^2

B. 316 m^2

C. 416 m^2

D. 516 m^2

Answer: A

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28. The difference between the lengths of the parallel sides of a trapezium is 8 cm, the perpendicular distance between these sides is

24 cm and the area of the trapezium is 312 cm^2. Find the length of each of the parallel sides.

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29. A parallelogram and a rhombus are equal in area. The diagonals of the rhombus measures 120 m and 44 m. If one of the sides of the parallelogram measures 66 m, find its corresponding altitude.

A. 40 m

B. 50 m

C. 60 m

D. 70 m

Answer: A

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30. A parallelogram and a square have the same area. If the sides of the square measure 40 m and corresponding base of the parallelogram.

A. 44 m

B. 54 m

C. 64 m

D. 74 m

Answer: C

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31. Find the area of a rhombus one side of which measures 20 cm and one of whose diagonals is 24 cm.

A. 384 cm^2

B. 364 cm^2

C. 354 cm^2

D. 374 cm^2

Answer: A

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32. The area of a rhombus is 480 cm^2, and one of its diagonals measures 48 cm. Find (i) the

length of the other diagonal, (ii) the length of each of its sides, and (iii) its perimeter.

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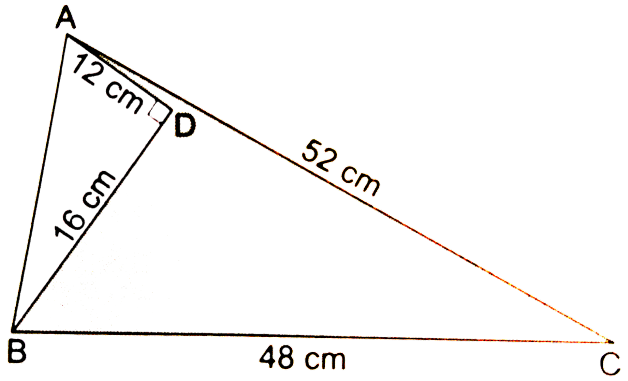
Exercise

1. Find the area of the shaded region in the figure given below:



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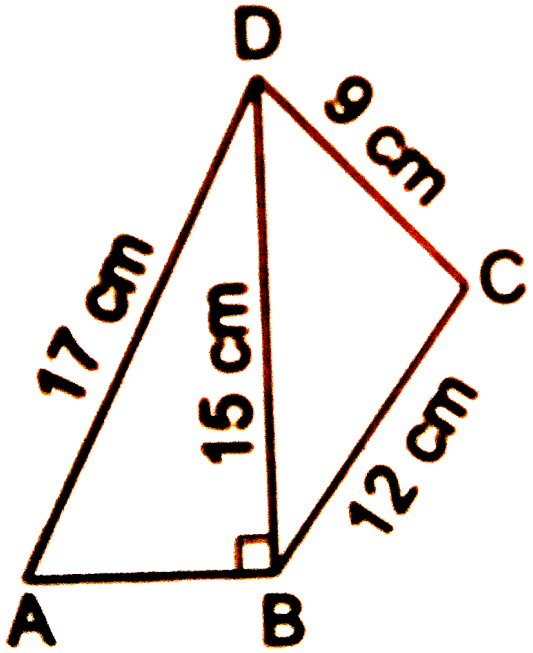
2. Find the perimeter and area of a quadrilateral ABCD in which BC = 12 cm, CD = 9

cm, BD = 15 cm, DA = 17 cm and $\angle ABD = 90^\circ$.



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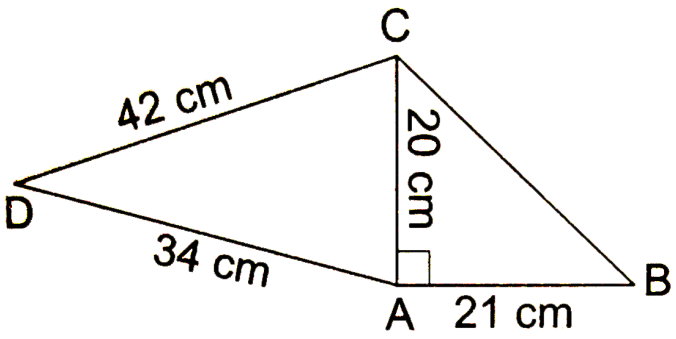
3. Find the perimeter and area of the quadrilateral ABCD in Which AB = 21 cm, $\angle BAC = 90^\circ$, AC = 20 cm, CD = 42 cm and AD = 34 cm.



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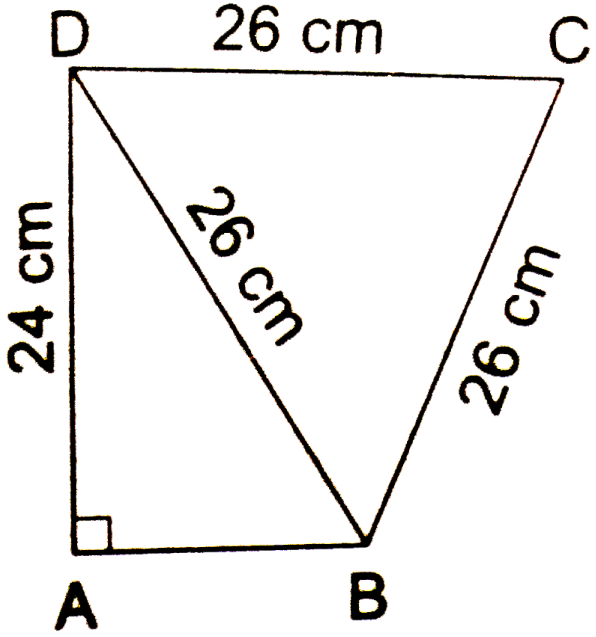
4. Find the area of the quadrilateral ABCD in Which BCD is an equilateral triangle, each of whose sides is 26 cm, AD = 24 cm and $\angle BAD = 90^\circ$. Also, find the perimeter of the quadrilateral. (Given, $\sqrt{3} = 1.73$.)



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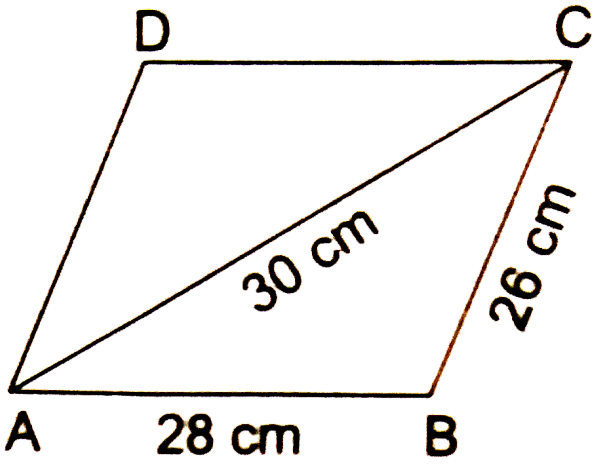
5. Find the area of a parallelogram ABCD in which AB = 28 cm, BC = 26 cm and diagonal AC = 30 cm.



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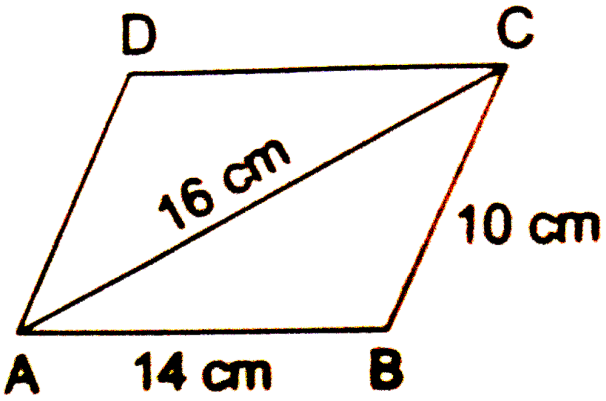
6. Find the area of a parallelogram ABCD in which AB = 14 cm, BC = 10 cm and AC = 16 cm. (Given, $\sqrt{3} = 1.73$.)



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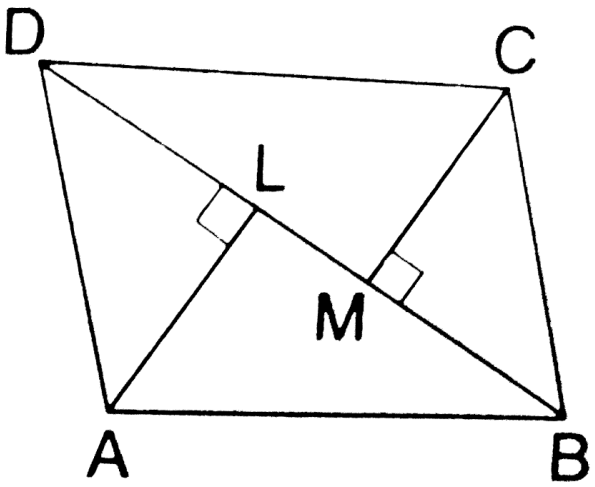
7. In the given figure, ABCD is a quadrilateral in which diagonal BD = 64 cm, AL $\perp$ BD and CM $\perp$ BD such that AL = 16.8 cm and CM = 13.2 cm. Calculate the area of the quadrilateral ABCD.



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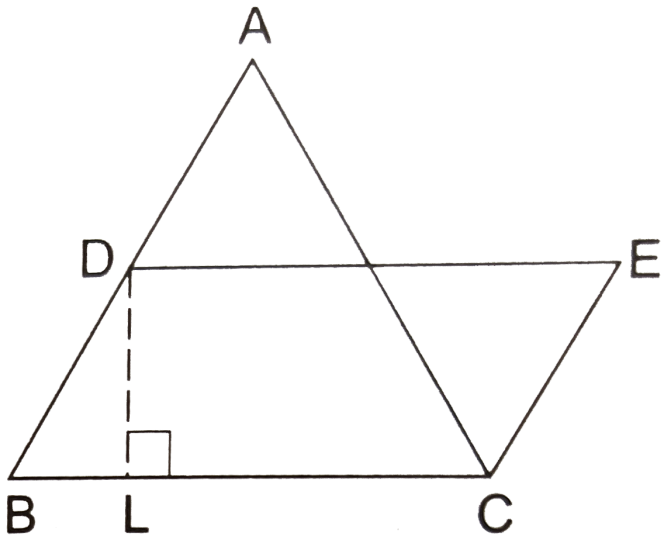
8. In the given figure, a ΔABC has been given in which AB = 7.5 cm, AC = 6.5 cm and BC = 7 cm. On base BC, a parallelogram DBCE of the same area as that of ΔABC is constructed. Find the height DL of the parallelogram.



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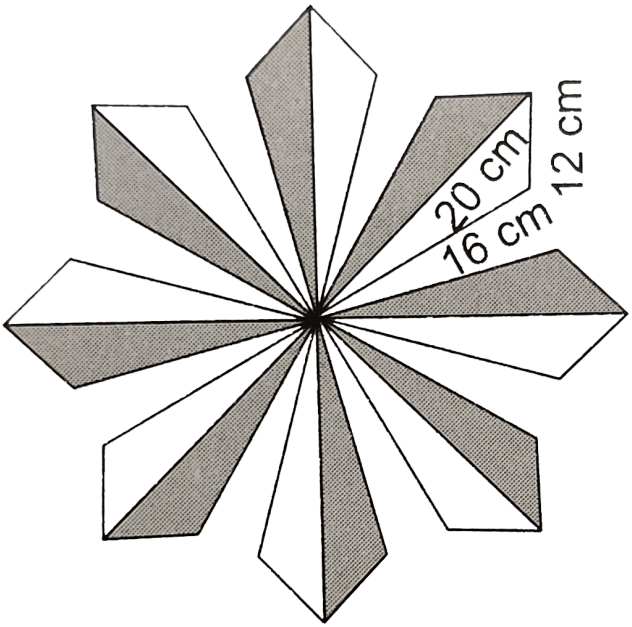
9. A floral design on a floor is made up of 16 tiles, each triangular in shape having sides 16 cm, 12 cm and 20 cm. Find the cost of polishing the tiles at Rs. 1 per sq cm.



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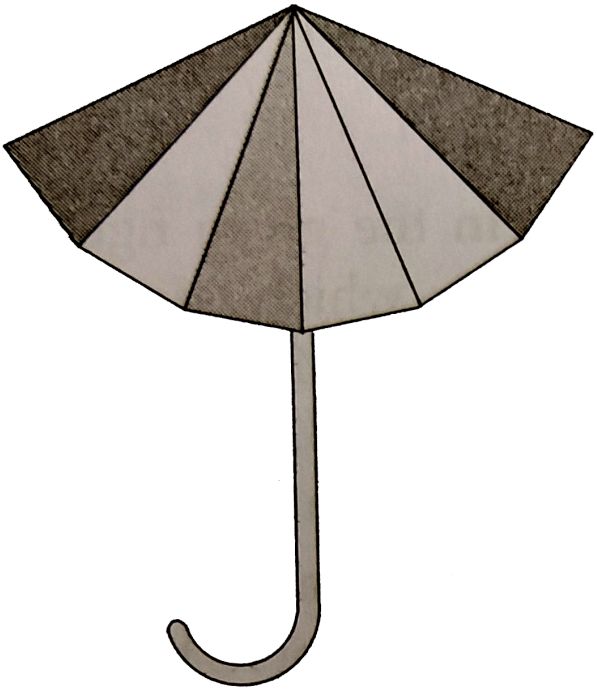
10. An umbrella is made by stitching 12 triangular pieces of cloth, each measuring $(50cm \times 20cm \times 50cm)$. Find the area of the cloth used in it.



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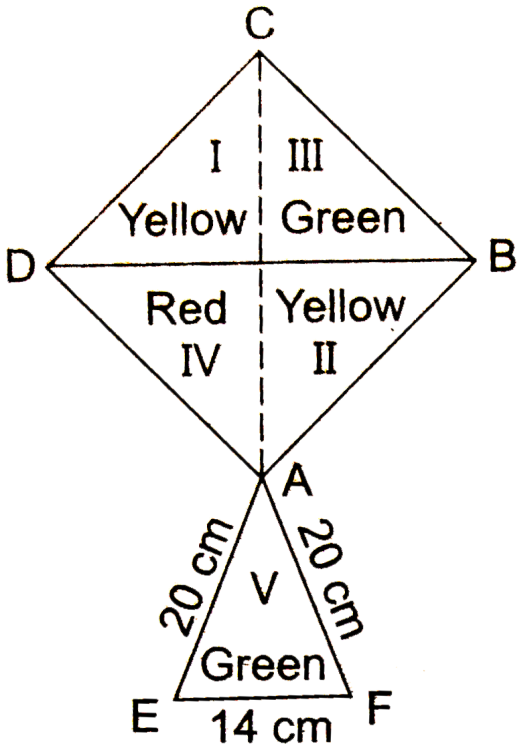
11. In the given figure, ABCD is a square with diagonal 44 cm. How much paper of each shade is needed to make a kite given in the

figure?



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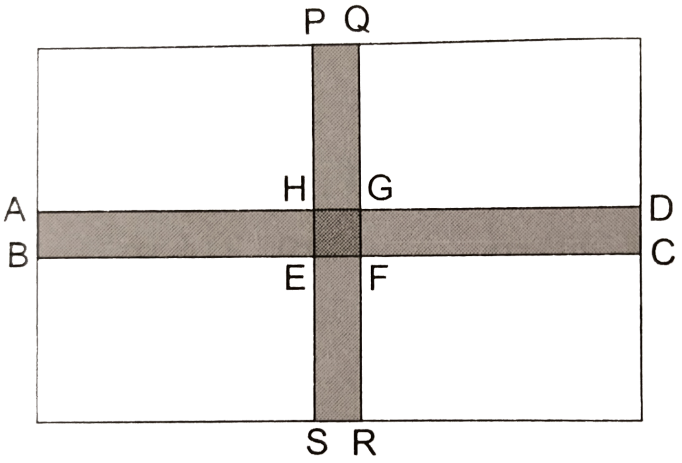
12. A rectangular lawn, 74 m by 60 m, has two roads, each road 4 m wide, running through the middle of the lawn, one parallel to length and the other parallel to breadth, as shown in the figure. Find the cost of gravelling the roads at Rs. 50 per m^2.



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Multiple Choice Questions Mcq

1. In a ΔABC, it given that base = 12 cm and height = 5 cm. Its area is

A. 60 cm^2

B. 30 cm^2

C. $15\sqrt{3}cm^2$

D. 45 cm^2

Answer: B

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2. The lengths of three sides of a triangle are 20 cm, 16 cm and 12 cm. The area of the triangle is

A. 96 cm^2

B. 120 cm^2

C. 144 cm^2

D. 160 cm^2

Answer: A

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3. Each side of an equilateral triangle measures 8 cm. The area of the triangle is

A. $8\sqrt{3}cm^2$

B. $\sqrt{\frac{3}{4}} \times 8^2 cm^2$

C. $32\sqrt{3}cm^2$

D. 48 cm^2

Answer: B

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4. The base of an isosceles triangle is 8 cm long and each of its equal sides measures 6 cm. The area of the triangle is

A. $16\sqrt{5}cm^2$

B. $8\sqrt{5}cm^2$

C. $16\sqrt{3}cm^2$

D. $8\sqrt{3}cm^2$

Answer: B

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5. The base of an isosceles triangle is 6 cm and each of its equal sides is 5 cm. The height of the triangle is

A. 8 cm

B. $\sqrt{30}$ cm

C. 4 cm

D. $\sqrt{11}$ cm

Answer: C

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6. Each of the two equal sides of an isosceles right triangle is 10 cm long. Its area is

A. $5\sqrt{10}cm^2$

B. 50 cm^2

C. $10\sqrt{3}cm^2$

D. 75 cm^2

Answer: B

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7. Each side of an equilateral triangle is 10 cm long. The height of the triangle is

A. $10\sqrt{3}$ cm

B. $5\sqrt{3}$ cm

C. $10\sqrt{2}$ cm

D. 5 cm

Answer: B

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8. The height of an equilateral triangle is 6 cm.

Its area is

A. $12\sqrt{3}cm^2$

B. $6\sqrt{3}cm^2$

C. $12\sqrt{2}cm^2$

D. 18 cm^2

Answer: A

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9. The lengths of the three sides of a triangular field are 40 m, 24 m and 32 m respectively. The area of the triangle is

A. 480 m^2

B. 320 m^2

C. 384 m^2

D. 360 m^2

Answer: C

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

A. 375 cm^2

B. 750 cm^2

C. 250 cm^2

D. 500 cm^2

Answer: B

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11. The lengths of the three sides of a triangle are 30 cm, 24 cm and 18 cm respectively. The length of the altitude of the triangle correspondihng to the smallest side is

A. 24 cm

B. 18 cm

C. 30 cm

D. 12 cm

Answer: A

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12. The base of an isosceles triangle is 16 cm and its area is 48 cm^2. The perimeter of the triangle is

A. 41 cm

B. 36 cm

C. 48 cm

D. 324 cm

Answer: B

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13. The area of an equilateral triangle is $36\sqrt{3}cm^2$. Its perimeter is

A. 36 cm

B. $12\sqrt{3}$ cm

C. 24 cm

D. 30 cm

Answer: A

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14. Each of the equal sides of an isosceles triangle is 13 cm and its base is 24 cm. The area of the triangle is

A. 156 cm^2

B. 78 cm^2

C. 60 cm^2

D. 120 cm^2

Answer: C

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15. The base of a right triangle is 48 cm and its hypotenuse is 50 cm long. The area of the triangle is

A. 168 cm^2

B. 252 cm^2

C. 336 cm^2

D. 504 cm^2

Answer: C

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16. If the area of an equilateral triangle is $81\sqrt{3}cm^2$, find its height.

A. $9\sqrt{3}$ cm

B. $6\sqrt{3}$ cm

C. $18\sqrt{3}$ cm

D. 9 cm

Answer: A

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