MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

HERON'S FORMULA

Others

1. A floral design on a floor is made up of 16 tiles which are triangular, the sides of the triangle being 9 cm, 28 cm and 35 cm (see Fig. 12.18). Find the cost of polishing the tiles at the rate of $50p\ per\ cm^2$.

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2. The lengths of the sides of a triangle are $5cm,\ 12cm and 13cm.$ Find the length of perpendicular from the opposite vertex to the side whose

length is $13cm.$

3. 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?

4. The perimeter of a triangular field is $450\ m$ and its sides are in the ratio $13:12:5.$ Find the area of the triangle.

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

6. Find the area of a triangle, two sides of which are 8 cm and 11 cm and the perimeter is 32 cm

7. An isosceles triangle has perimeter 30 cm and each of the equal sides is 12 cm. Find the area of the triangle.

8. Find the area of a triangle whose sides are $13cm$, $14cm$, $15cm$

9. The sides of a quadrangular field, taken in order are $26m, 27m, 7m$ are $24m$ respectively. The angle contained by the last two sides is a right angle. Find the area.

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10. Find the area of a trapezium whose parallel sides $25cm, 13cm$ and other sides are $15cm$ and $15cm$.

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11. Find the area of a rhombus whose perimeter is $80m$ and one of whose diagonal is $24m.$

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12. The adjacent sides of a parallelogram $ABCD$ measure 34 cm and 20 cm , and the diagonal AC measures 42 cm Find the area of the parallelogram.

13. A field is in the shape of a trapezium whose parallel sides are 25m and 10 m. The non-parallel sides are 14m and 13m. Find the area of the field.

14. A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 26 cm, 28 cm and 30 cm, and the parallelogram stands on the base 28 cm, find the height of the parallelogram.

15. The perimeter of a triangular field is 240dm. If two of its sides are 78dm and 50dm, find the length of the perpendicular on the side of length 50dm from the opposite vertex.

16. The perimeter of a triangular field is 540 m and its sides are in the ratio $25 : 17 : 12$. Find the area of the triangle. Also, find the cost ploughing the field at $Rs. 18.80$ per $10m^2$

17. A triangle has sides $35cm, 54cm$ and $61cm$ long. Find its area. Also, find the smallest of its altitudes.

18. Find the area of the quadrilateral $ABCD$, in which $AB = 7cm, BC = 6cm, CD = 12cm, DA = 15cm$ and $AC = 9cm$

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19. Find the area of a triangle ABC whose sides are $9m$,$12m$ and $15m$ respectively.

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20. Find the area of a triangle whose sides are $13cm, 14cm, 15cm$

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21. Find the area of a triangle, two sides of which are 8 cm and 11 cm and the perimeter is 32 cm

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22. An isosceles triangle has perimeter $30cm$ and each of the equal sides

os $12\ cm$. Find the area of the triangle.

A. $8\sqrt{15}cm^2$

B. $7\sqrt{15}cm^2$

C. $9\sqrt{15}cm^2$

D. $4\sqrt{15}cm^2$

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23. The perimeter of a triangular field is $450\ m$ and its sides are in the

ratio $13:12:5$. Find the area of the triangle.

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

25. The lengths of the sides of a triangle are $5\ cm,\ 12\ cm\ and\ 13cm.$ Find the length of perpendicular from the opposite vertex to the side whose length is $13\ cm.$

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

27. The triangle side walls of a flyover have been used for advertisements. The sides of the walls are $122m, \ 22m \ and \ 120m.$. The advertisements yield an earning of $Rs.5000 \ per \ m^2 per \ year.$ A company hired both walls for 3 months. How much rent did it pay?

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28. A triangular pack ABC HAS SIDES $120m, \ 80m \ and \ 50m$. (See in Figure). A gardener Dhania has to put a fence all around it and also plant grass inside. How much area does she need to plant? Find the cost of fencing it with barbed wire at the rate of Rs. 20 per metre leaving a space $3m$ wide for a gate on one side.

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29. There is a slide in a park. One of its side walls has been painted in some colour with a message KEEP THE PARK GREEN AND CLEAN (See in

Figure) If the sides of the wall are $15m$, $11m$ and $6m$, find the area painted in colour.

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

31. Find the area of a triangle whose sides are respectively 150 cm, 120 cm and 200 cm.

32. Find the area of a triangle hose sides are $9cm$, $12cm$ and 15 cm.

33. Find the area of a triangle two sides of which are $18 \, cm \, and \, 10 \, cm$ and the perimeter is $42 \, cm.$

34. In a $\triangle ABC, \ AB = 15cm, \ BC = 13cm \ and \ AC = 14cm.$ Find the area of $\triangle ABC \ and$ hence its altitude on AC

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

36. The perimeter of a triangle is $300m$. If its sides are in the ratio $3:5:7$. Find the area of the triangle.

37. The perimeter of a triangular field is 240dm. If two of its sides are 78dm and 50dm, find the length of the perpendicular on the side of length 50dm from the opposite vertex.

38. A triangle has sides $35cm$, $54cm$ and $61cm$ long. Find its area. Also, find the smallest of its altitudes.

39. 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.

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40. The perimeter of an isosceles triangle is $42cm$ and its base is $\left(\dfrac{3}{2}\right)$ times each of the equal sides. Find the length of each side of the triangle, area of the triangle and the height of the triangle.

Let two equal sides AB and AC be x &x

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41. Find the area of a quadrilateral $ABCD$ whose sides are $9\,m,\ 40\,m,\ 28\,m\ and\ 15\,m$ respectively and the angle between the first two sides is a right angle.

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42. Find the area of the quadrilateral $ABCD,$ in which $AB = 7cm,\ BC = 6cm,\ CD = 12\ cm,\ DA = 15cm\ and\ AC = 9\ cm.$

43. A field is in the shape of a trapezium whose parallel sides are 25m and 10 m. The non-parallel sides are 14m and 13m. Find the area of the field. Let ABCD be a trapezium with,$AB \parallel CD$

44. Find the area of a trapezium whose parallel sides $25cm,\ 13cm$ and other sides are $15cm\ and\ 15cm.$

45. Q. A rhombus shaped field has green grass for 18 cows to graze. If each side of the rhombus is 30 m and its longer diagonal is 48 m, how much area of grass field will each cow be getting?

46. Sanya has a piece of land which is in the shape of a rhombus. She wants her one daughter and one son to work on the land and produce different crops to suffice the needs of their family. She divided the land in two equals parts. If the perimeter of the land is $400m$ and one of the diagonals is $160m$, how much area each of them will get?

47. Kamla has a triangular field with sides 240 m, 200 m, 360 m, where she grew wheat. In another triangular field with sides 240 m, 320 m, 400 m adjacent to the previous field, she wanted to grow potatoes and onions. 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 one part. How much area (in hectares) has been used for wh)

48. Find the area of a quadrilateral $ABCD$ is which

$AB = 3cm, \ BC = 4cm, \ CD = 4cm, \ DA = 5cm \ and \ AC = 5cm$

$S = \dfrac{1}{2}(a + b + c) = \dfrac{1}{2}(3 + 4 + 5) = 6$

$ar of \ ABC$=sqrt(s(s-a)(s-b)(s-c)ar ABC=$\sqrt{6(6 - 3)(6 - 4)(6 - 5)}$

$\Rightarrow \sqrt{6 \times 3 \times 2 \times 1} = 6cm^2$

Now in $\triangle ADC, \ S = \dfrac{a + b + c}{2}$

$\Rightarrow s = \dfrac{5 + 4 + 5}{2} = \dfrac{14}{2} = 7cm$

By using Heron's formula

Area of $\triangle ADC = \sqrt{s(s - a)(s - b)(s - c)}$

$= \sqrt{7(7 - 5)(7 - 4)(7 - 5)}$

$= \sqrt{7 \times 2 \times 3 \times 2}$

$= 2\sqrt{21}cm^2$

Area of $\triangle ADC = 9.2cm^2$ (approx.)

Area of the quadrilateral ABCD = Area of

$$\triangle ADC + Area of \triangle ABC = 9.2cm^2 + 6cm^2 = 15.2cm^2$$

Thus, the area of the quadrilateral,$ABCD$is$15.2cm^2$.

49. The sides of a quadrangular field, taken in order are $26m,\ 27m, 7m\ and\ 24m$ respectively. The angle contained by the last two sides is a right angle. Find its area.

50. The sides of quadrilateral, taken in order are 5, 12, 14 and 15 metres respectively, and the angle contained by the first two sides is a right angle. Find its area.

51. A park, in the shape of a quadrilateral $ABCD,\ has\ \angle C = 90°,\ AB = 9cm,\ BC = 12cm,\ CD = 5m\ and\ AD =$ How much area does it occupy? So, we can calculate BD by applying Pythagoras theorem

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52. Two parallel side of a trapezium are $60cm\ and\ 77cm$ and other sides are $25cm\ and\ 26cm.$ Find the area of the trapezium.

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53. Find the area of a rhombus whose perimeter is $80m$ and one of whose diagonal is $24m.$

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54. A rhombus sheet, whose perimeter is $32m$ and whose one diagonal is $10m$ long, is painted on both sides at the rate of Rs. $5\,per\,m^2$. Find the cost of painting.

55. Find the area of a quadrilateral $ABCD$ in which $AD = 24cm,\ \angle BAD = 90^0 and\ BCD$ from an equilateral triangle whose each side is equal to $26cm$.

56. Find the area of a quadrilateral $ABCD$ in which $AB = 42m,\ BC = 21cm, CD = 29cm, DA = 34cm$ and diagonal $BD = 20cm$

57. Find the area of the quadrilateral ABCD; in which AB = 7 cm; BC =6 cm;CD =12 cm; DA= 15 cm and AC =9 cm

58. The adjacent sides of a parallelogram $ABCD$ measure $34 cm and 20 cm,$ and the diagonal AC measures $42 cm.$ Find the area of the parallelogram.
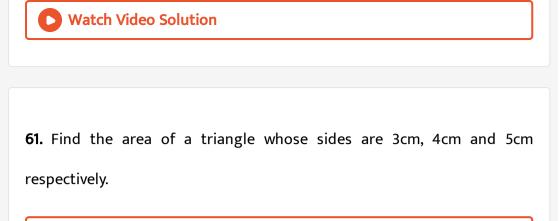
59. The adjacent sides of a parallelogram $ABCD$ measures $34 cm$ and $20 cm$ and the diagonal $AC = 42 cm$ Then find its area

60. Find the area of a triangle whose base and altitude are 5cm and 4cm respectively.

61. Find the area of a triangle whose sides are 3cm, 4cm and 5cm respectively.

62. Find the area of an isosceles triangle having the base $x\ cm$ and one side $y\ cm$

63. Find the area of an equilateral triangle having each side $4cm$.

In equilateral triangle ABC, $AB = BC = AC = a$

$$s = \frac{1}{2}(a + a + a)$$
$$= \frac{3}{2}a$$

now, ar $\triangle ABC = \sqrt{\frac{3}{2}a\left(\frac{3}{2}a - a\right)\left(\frac{3}{2}a - a\right)\left(\frac{3}{2}a - a\right)}$

$$\Rightarrow \sqrt{\frac{3}{2}a \times \frac{a}{2} \times \frac{a}{2} \times \frac{a}{2}}$$

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

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

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64. Find the area of an equilateral triangle having each side x cm

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65. The perimeter of a triangular field is 144 m and the ratio of the sides is 3:4:5. Find the area of the field.

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66. Find the area of an equilateral triangle having altitude h cm.

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67. Let Δ be the area of a triangle. Find the area of a triangle whose each side is twice the side of the given triangle.

68. If each side of a triangle is doubled, then find percentage increase in its area.

69. The sides of a triangle are $16cm, \ 30cm \ and \ 34cm.$ Its area is

$225 \ cm^2$ (b) $240 \ cm^2$ $225 \ \sqrt{2} \ cm^2$ (d) $450 \ cm^2$

70. The sides of a triangle are $7\ cm,\ 9\ cm\ and\ 14\ cm$. Its area is

$12\sqrt{5}\ cm^2$ (b) $12\sqrt{3}\ cm^2$ $24\sqrt{5}\ cm^2$ (d) $63\ cm^2$

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71. The sides of a triangle field are $325m,\ 300m\ and\ 125m$. Its area is

$18750m^2$ (b) $37500m^2$ (c) $97500m^2$ (d) $48750m^2$

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72. The sides of a triangle are $50cm,78cm$ and $112cm$ The smallest altitude is

(a) $20cm$

(b) $30cm$

(c) $40cm$

(d) $50cm$

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73. The sides of a triangle are $11cm, \; 15cm \; and \; 16cm$. The altitude to the largest side is

$30 \; \sqrt{7} \; cm$ (b) $\dfrac{15\sqrt{7}}{2} \; cm$ (c) $\dfrac{15 \; \sqrt{7}}{4} cm$ (d) $30 \; cm$

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74. If the length of median of an equilateral triangle is xcm then its area is

$a. \; x^2, \; b. \; \left(\dfrac{\sqrt{3}}{2} \right) x^2, \; c. \; \dfrac{x^2}{\sqrt{3}}, \; d. \; \dfrac{x^2}{2}$

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75. The lengths of the sides of $\triangle ABC$ are consecutive integers. In $\triangle ABC$ has the same perimeter as an equilateral triangle triangle with a side of length 9cm, what is the length of the shortest side of $\triangle ABC$?

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76. The base and hypotenuse of a right triangle are respectively 5cm and 13cm long. Its area is:

$25cm^2$ (b) $28cm^2$ (c) $30cm^2$ (d) $40cm^2$

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77. If the length of each side of an equilateral triangle of area $4\sqrt{3}\ cm^2$, is

$4\ cm$ (b) $\dfrac{4}{\sqrt{3}}cm$ (c) $\dfrac{\sqrt{3}}{4}\ cm$ (d) $3\ cm$

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78. If every side of a triangle is doubled, then increase in the area of the triangle is

(a) $100\sqrt{2}\ \%$

(b) 200%

(c) 300%

(d) 400%

79. A square and an equilateral triangle have equal perimeters. If the diagonal of the square is $12\sqrt{2}\ cm$, then area of the triangle is:

$24\sqrt{2}\ cm^2$

(b) $24\sqrt{3}\ cm^2$

$48\sqrt{3}\ cm^2$

(d) $64\sqrt{3}\ cm^2$