



## MATHS

### BOOKS - RD SHARMA MATHS (ENGLISH)

#### MENSURATION-I (AREA OF A TRAPEZIUM AND A POLYGON)

Others

1. A square and a rectangular field with measurements as given in the figure have the same perimeter. Which field has a larger area?



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2. The length and breadth of a rectangular field are in the ratio 3:2. If the area of the field is  $3456 m^2$ , find the cost of fencing the field at Rs. 3.50 per metre.




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3. The cost of turfing a rectangular field at 85 paise per square metre is Rs 624.75. Find the perimeter of the field if its sides are in the ratio 5 : 3.



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4. The shape of a garden is rectangular in the middle and semi circular at the ends as shown in the diagram. Find the area and the perimeter of this garden [Length of rectangle is   $20\text{ m}$ ]



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5. The dimensions of a room are  $16 \times 14 \times 10$  metres. There are 4 windows of  $1.3\text{ m} \times 1.4\text{ m}$  and 2 doors of  $2\text{ m} \times 1\text{ m}$ . What will be the cost of white washing the walls and painting the doors and windows, if the rate of white washing is  $\text{Rs.}5 \text{ per } \text{m}^2$  and the rate of painting is  $\text{Rs.}8 \text{ per } \text{m}^2$ .



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6. A room is 7 metres long and 5 metres broad. It has one door measuring 2m by 1.5m and two windows, each measuring 1.5m by 1m. The cost of painting the walls at Rs. 12.50 per square metre is Rs. 825. Find the height of the room.



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7. The area of square  $ABCD$  is  $16 \text{ cm}^2$ . Find the area of the square joining the mid-point of the sides.



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8. The base of a parallelogram is thrice its height. If the area is  $867 \text{ cm}^2$  find the base and height of the parallelogram.



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9. Find the area of a rhombus having each side equal to 13 cm and one of whose diagonals is 24 cm.

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10. If the area of a rhombus is  $24\text{cm}^2$  and one of its diagonals is 4 cm, find the perimeter of the rhombus.

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11. An ant is moving around a few food pieces of different shapes scattered on the floor. For which food-piece would the ant have to take a longer round? Remember, circumference of a circle can be obtained by using the expression  $c = 2\pi r$ , where  $r$  is the radius of the circle.

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12. Mrs. Kaushik has a square plot with the measurement as shown in the figure. She wants to construct a house in the middle of the plot. A garden is developed around the house. Find the total cost of developing a garden around the house at the rate of Rs 55 per  $m^2$ .

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13. A field in the form of a parallelogram has one of its diagonals 42 m long the perpendicular distance of this diagonal from either of the outlying vertices is 10.8 m. Find the area of the field.

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14. One diagonal of a quadrilateral is 20 m long and the perpendiculars to it from the opposite vertices are 8.5 m and 11 m. Find the area of the quadrilateral.

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15. In quadrilateral  $ABCD$  show in Figure.  $AB \parallel DC$  and  $AD \perp AB$ . Also,  $AB = 8m$ ,  $DC = BC = 5m$ . Find the area of the quadrilateral.

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16. Find the area of the shaded region in the given Figure, if  $ABCD$  is a square of side 14 cm and  $APD$  and  $BPC$  are semi-circles.

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17. A paper is in the form of a rectangle  $ABCD$  in which  $AB = 20cm$  and  $BC = 14cm$ . A semi-circular portion with  $BC$  as diameter is cut off. Find the area of a remaining part.

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18. In the given figure, find the area of the shaded region [ $Use \pi = 3.14$ ]



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19. An athletic track 14m wide consists of two straight section 120m long joining semi-circular ends whose inner radius is 35m. Calculate the area of the shaded shaded region.

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20. A flooring tile has the shape of a parallelogram whose base is 24 cm and the corresponding height is 10 cm. How many such tiles are required to cover a floor of area 1080 m<sup>2</sup>? (If required you can split the tiles in whatever way you want to fill up the corners).

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21. A plot is in the form of a rectangle  $ABCD$  having semi-circle on  $BC$  as shown in Figure. If  $AB = 60m$  and  $BC = 28cm$ , find the area of the plot.

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22. A playground has the shape of a rectangle, with two semi-circles on its smaller sides as diameters, added to its outside. If the sides of the rectangle are  $36m$  and  $24.5m$ , find the area of the playground.  $\left( Take \pi = \frac{22}{7} \right)$

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23. A rectangular piece is  $20m$  and  $15m$  wide. From its four corners, quadrants of radii  $3.5m$  have been cut. Find the area of the remaining part.

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24. The inside perimeter of a running track (shown in figure) is  $400m$ . The length of each of the straight portion is  $90m$  and the ends are semi-circles. If track is everywhere  $14m$  wide, find the area of the track. Also, find the length of the outer running track.

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25. Find the area of Figure, in square cm, correct to one place of decimal.

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

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26. The diameter of a wheel of a bus is  $90\text{cm}$  which makes 315 revolutions per minute. Determine its speed in kilometres per hour.  $\left( \text{Take } \pi = \frac{22}{7} \right)$

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27. The area of a rhombus is  $240\text{ cm}^2$  and one of the diagonal is  $16\text{cm}$ . Find another diagonal.

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28. The diagonals of a rhombus are  $7.5\text{ cm}$  and  $12\text{ cm}$ . Find its area.



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29. The diagonal of a quadrilateral shaped field is 24 m and the perpendiculars dropped on it from the remaining opposite vertices are 8 m and 13 m. Find the area of the field.

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30. Find the area of a rhombus whose side is 6 cm and whose altitude is 4 cm. If one of its diagonals is 8 cm long, find the length of the other diagonal.

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31. The floor of a building consists of 3000 tiles which are rhombus shaped and each of its diagonals are 45 cm and 30 cm in length. Find the total cost of polishing the floor, if the cost per  $m^2$  is Rs 4.

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**32.** A rectangular grassy plot is 112m long and 78m broad. It has a gravel path 2.5m wide all around it on the side. Find the area of the path and the cost of constructing it at Rs. 4.50 per square metre.

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**33.** Find the area of a rhombus, each side of which measures 20 cm and one of whose diagonals is 24 cm.

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**34.** The length of a side of a square field is 4 m. What will be the altitude of the rhombus, if the area of the rhombus is equal to the square field and one of its diagonals is 2 m?

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**35.** Find the area of the field in the form of a rhombus, if the length of each side be 14cm and the altitude be 16cm.

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**36.** The cost of fencing a square field at 60 paise per metre is Rs. 1200. Find the cost of reaping the field at the rate of 50 paise per 100 sq. metres.

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**37.** In exchange of a square plot one of whose sides is 84m, a man wants to buy a rectangular plot 144 m long and of the same areas of the square plot. Find the width of the rectangular plot.

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**38.** The area of a rhombus is  $84 \text{ m}^2$ . If its perimeter is 40m, then find its altitude.



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39. A garden is in the form of a rhombus whose side is 30 metres and the corresponding altitude is 16m. Find the cost of levelling the garden at the rate of Rs. 2 per  $m^2$ .



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40. A field in the form of a rhombus has each side of length 64m and altitude 16m. What is the side of a square field which has the same area as that of a rhombus?



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41. The area of a rhombus is equal to the area of a triangle whose base and the corresponding altitude are 24.8cm and 16.5cm respectively. If one of the diagonals of the rhombus is 22cm, find the length of the other diagonal.



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**42.** Find the area of a trapezium whose parallel sides are of lengths 10cm and 12cm and the distance between them is 4cm.

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**43.** The area of a trapezium is  $440 \text{ cm}^2$ . The lengths of the parallel sides are respectively 30cm and 14cm. Find the distance between them.

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**44.** The area of a trapezium shaped field is  $480 \text{ m}^2$ , the distance between two parallel sides is 15 m and one of the parallel side is 20 m. Find the other parallel side.

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45. Find the altitude of a trapezium, the sum of the length of whose bases is 6.5cm and whose area is  $26\text{cm}^2$ .

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46. Find the sum of the lengths of the bases of a trapezium whose altitude is 11cm and whose area is  $0.55\text{m}^2$ .

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47. The area of the trapezium is  $105\text{cm}^2$  and its height is 7 cm. If one of the parallel sides is longer than the other by 6 cm find the two parallel sides.

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48. The area of a trapezium is  $180\text{cm}^2$  and its height is 12cm. If one of the parallel sides is double that of the other, find the two parallel sides.



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49. Find the area of a trapezium whose parallel sides are  $20\text{cm}$  and  $10\text{cm}$  and other sides are  $13\text{cm}$  and  $13\text{cm}$

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50. If the perimeter of a trapezium be  $52\text{cm}$ , its non parallel sides are equal to  $10\text{cm}$  each and its altitude is  $8\text{cm}$ , find the area of the trapezium.

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51. The area of a trapezium is  $180\text{cm}^2$  and its height is  $9\text{cm}$ . If one of the parallel sides is longer than the other by  $6\text{cm}$ , the length of the longer of the parallel sides is

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52. In the adjoining figure  $ABDC$  and  $DA$  is perpendicular to  $AB$ . Further,  $DC = 7\text{cm}$ ,  $CB = 10\text{cm}$  and  $AB = 13\text{cm}$ . Find the area of the quadrilateral  $ABCD$ .

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53. Length of the fence of a trapezium shaped field  $ABCD$  is  $120\text{m}$ . If  $BC = 48\text{m}$ ,  $CD = 17\text{m}$  and  $AD = 40\text{m}$ , find the area of this field. Side  $AB$  is perpendicular to the parallel sides  $AD$  and  $BC$ .

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54. The parallel sides  $DC$  and  $AB$  of a trapezium are  $12\text{ cm}$  and  $36\text{ cm}$  respectively. Its non-parallel sides are each equal to  $15\text{ cm}$ . Find the area of the trapezium.

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55. Diagram of the adjacent picture frame has outer dimensions =  $24\text{cm} \times 28\text{cm}$ . inner dimensions  $16\text{cm} \times 20\text{cm}$ . Find the area of each section of the frame, if the width of each section is same.

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56. Find the area, in square metres, of the trapezium whose bases and altitudes are: bases = 12dm and 30dm, altitude = 10dm

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57. Find the area of trapezium with base 15cm and height 8cm, if the side parallel to the given base is 9cm long.

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58. Find the area of a trapezium whose parallel side are of length 16dm and 22dm and whose height is 12dm.

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59. Find the height of a trapezium, the sum of the lengths of whose base (parallel sides) is 60cm and whose area is  $600 \text{ cm}^2$ .

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60. Find the altitude of a trapezium whose area is  $65 \text{ cm}^2$  and whose bases are 13cm and 26cm.

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61. Find the sum of the lengths of the bases of a trapezium whose area is  $4.2 \text{ m}^2$  and whose height is 280 cm.



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62. Find the area of a trapezium whose parallel sides of lengths 10cm and 15cm are at a distance of 6cm from each other. Calculate this area as (a) the sum of the areas of two triangles and one rectangle. (b) the difference of the area of a rectangle and the sum of the areas of two triangles.

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63. The area of a trapezium is  $960 \text{ cm}^2$ . If the parallel sides are 34cm and 46cm, find the distance between them.

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64. Find the area of Figure, as the sum of the area of two trapezium and a rectangle.

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65. Find area of a trapezium whose parallel sides are  $28\text{cm}$  and  $14\text{cm}$  and the distance between them is  $5\text{cm}$ .

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66. The cross-section of a canal is a trapezium in shape. If the canal is  $10\text{m}$  wide at the top  $6\text{m}$  wide at the bottom and the area of cross-section is  $72\text{m}^2$  determine its depth.

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67. The area of a trapezium is  $91\text{ cm}^2$  and its height is  $7\text{cm}$ . If one of the parallel sides is longer than the other by  $8\text{cm}$ , find the two parallel sides.

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68. The area of a trapezium is  $384 \text{ cm}^2$ . Its parallel sides are in the ratio 3:5 and the perpendicular distance between them is 12cm. Find the length of each one of the parallel sides.

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69. Mohan wants to buy a trapezium shaped field. Its side along the river is parallel to and twice the side along the road. If the area of this field is 10500  $\text{m}^2$  and the perpendicular distance between the two parallel sides is 100 m, find the length of the side along the river.

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70. The area of a trapezium is  $1586 \text{ cm}^2$  and the distance between the parallel sides is 26 cm. If one of the parallel sides is 38cm, find the other.

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71. The parallel sides of a trapezium are 25cm and 13cm; its nonparallel sides are equal, each being 10cm, find the area of the trapezium.

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

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73. If the area of a trapezium is  $28\text{cm}^2$  and one of its parallel sides is 6cm, find the other parallel side if its altitude is 4cm.

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74. In Figure, a parallelogram is drawn in a trapezium, the area of the parallelogram is  $80\text{ cm}^2$ , find the area of the trapezium.

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75. Find the area of the field shown in Figure by dividing it into a square, a rectangle and a trapezium.

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76. Find the area of the pentagon  $ABCDE$  shown in Figure, if  $AD = 8\text{cm}$ ,  $AH = 6\text{cm}$ ,  $AG = 4\text{cm}$ ,  $AF = 3\text{cm}$ ,  $BF = 2\text{cm}$ ,  $CH = 3\text{cm}$ .

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77. Find the area of the hexagon shown in Figure if  $MP=9\text{ cm}$ ,  $MD=7\text{ cm}$ ,  $MC=6\text{ cm}$ ,  $MB=4\text{ cm}$ ,  $MA=2\text{ cm}$ .  $NA, OC, QD$  and  $RB$  are perpendiculars to diagonal  $MP$ .

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78. Find the area of the pentagonal park shown in Figure in two different ways:

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79. There is a regular hexagon  $MNOPQR$  of side 5 cm . aman and ridhima divided it into two different ways . Find the area of this hexagon both ways.

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80. 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.

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81. Find the area of the pentagon shown in Figure, if  $AD = 10\text{cm}$ ,  $AG = 8\text{cm}$ ,  $AH = 6\text{cm}$ ,  $AF = 5\text{cm}$ ,  $BF = 5\text{cm}$ ,  $CG = 7\text{cm}$

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82. There is a pentagonal shaped park as shown in the figure. For finding its area Jyoti and Kavita divided it in two different ways. Find the area of this park using both ways. Can you suggest some other way of finding its area?

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83. Find the area of the following polygon, if  $AL = 10\text{cm}$ ,  $AM = 20\text{cm}$ ,  $AN = 50\text{cm}$ ,  $AO = 60\text{cm}$  and  $AD = 90\text{cm}$ .

Figure

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84. Find the area of the following regular hexagon Figure

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