MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

MENSURATION-II (VOLUMES AND SURFACE AREAS OF A CUBOID AND A CUBE)

Others

1. Find the volume of a cuboid whose (i) length = 10cm, breadth=8cm, height = 3cm. (ii) length = 1.5m, breadth=25cm, height=15cm

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2. Find the volume of a cube whose side is 7cm.

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3. A cuboidal wooden block contains $189 \ cm^3$ wood. If it be 7cm long and 4.5cm high, find its breadth.

4. Find the height of a cuboid whose volume is $275cm^3$ and base area is $25cm^2$.

5. A cuboidal vessel is 10 cm long and 8 cm wide. How high must it be made to hold 480 cubic centimetres of a liquid ?

6. The edge of cube is 20 cm. How many smallcubes of 5 cm edge can be formed from this cube ?

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7. A matchbox measures $4cm \times 2.5cm \times 1.5cm$. What will be the volume of a packet containing 12 such boxes

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8. If each edge of a cube is doubled, (i) how many times will its surface area increase? (ii) how many times will its volume increase?

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9. A rectangular block of ice measures 40cm by 25cm by 15cm. Calculate its weight in kg, if ice weighs $\dfrac{9}{10}$ of the weight of the same volume of water and $1\ cm^3$ of water weighs 1 gm.

10. Eight identical cuboidal wooden blocks are stacked one on top of the other. The total volume of the solid so formed is $128\ cm^3$. If the height of each block is 1cm and the base is a square, find the dimensions of each block.

11. Find the volume of a cuboid whose (i) length =12 c m ,breadth= 8cm , height = 6cm (ii) length = 1. 2 cm , breadth= 30 cm , height = 15 c m (iii) length = 15 cm ,breadth=2. 5dm, height = 8cm

12. Find the volume of a cube whose side is 4cm (ii) 8cm (iii) 1.5dm (iv) 1.2m (d 25mm

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13. Find the height of a cuboid of volume $100\ cm^3$, whose length and breadth are 5cm and 4cm respectively.

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14. A cuboidal vessel is 10cm long and 5cm wide. How high it must be made to hold $300\ cm^3$ of a liquid?

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15. A milk container is 8cm long and 50cm wide. What should be its height so that it can hold 4 litres of milk?

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16. A cuboidal wooden block contains $36\ cm^3$ wood. If it be 4cm long and 3cm wide, find its height.

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17. What will happen to the volume of a cube, if its edge. halved

(ii) trebled?

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18. What will happen to the volume of a cuboid if its: (a) Length is doubled, height is same and breadth is halved? (b) Length is doubled, height is doubled and breadth is same?

19. Three cuboids of dimensions $5cm \times 6cm \times 7cm$, $4cm \times 7cm \times 8cm$ and $2cm \times 3cm \times 13cm$ are melted and a cube is made. Find the side of cube.

20. Find the weight of solid rectangular iron piece of size $50cm \times 40cm \times 10cm$, if $1cm^3$ of iron weighs $8gm$.

21. How many wooden cubical blocks of side 25cm can be cut from a log of wood of size 3m by 75cm by 50cm, assuming that there is no wastage?

22. A cuboidal block of silver is 9cm long, 4cm broad and 3.5cm in height. From it, beads of volume $1.5cm^3$ each are to be made. Find the number of beads that can be made from the block.

23. Find the number of cuboidal boxes measuring 2cm by 3cm by 10cm which can be stored in a cartonwhose dimensions are 40cm, 36cm and 24cm.

24. A cuboidal block of solid iron has dimensions 50 cm,45 cm and 34 cm. How many cuboids of size 5 cm by 3 cm by 2 cm can be obtained from this block? Assume cutting causes no wastage.

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25. Find ratio of volume of cube A to volume of cube B if side of cube A is three times than the side of cube B.

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26. An ice-cream brick measures 20cm by 10cm by 7cm. How many such bricks can be stored in deep fridge whose inner dimensions are 100cm by 50cm by 42cm?

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27. Each edge of two cubes are 2 cm and 4 cm and their volumes are $v1$ and $v2$.find $v1 : v2$.

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28. A tea-packet measures $10cm \times 6cm \times 4cm$. How many such tea-packets can be placed in a cardboard box of dimensions $50cm \times 30cm \times 0.2m$?

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29. The weight of a metal block of size 5 cm by 4 cm by 3 cm is 1 kg. Find the weight of a block of the same metal of size 15 cm by 8 cm by 3 cm.

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30. How many soap cakes each measuring 7cm× 5cm× 2.5cm can be placed in a box of size 56cm× 40cm× 25cm ?

31. The volume of a cuboidal box is $48cm^3$. If its height and length are 3cm and 4 cm respectively, find its breadth(in cm).

32. Find the volume in cubic metre (cu.m) of each of the cuboids whose dimensions are: (a) Length = 10m, breadth =8m, height = 2.5m (b) Length = 2m, breadth = 1.5m, height = 25cm (c) Length = 12m, breadth = 35dm, height = 50 cm

33. Find the volume in $cu \ dm$ of each of the cubes whose side is (i)
1. $2m$ (ii) $25cm$ (iii) $1 \ dm \ 5cm$

34. The length, breadth and height of a room are $8m, \ 6.5m \ and \ 3.5m$ respectively. Find the volume of the air contained in the room.

35. A godown is in the form of a cuboid of measures $60m \times 40m \times 30m$. How many cuboidal boxes can be stored in it if the volume of one box is $0.8m^3$?

36. A rectangular water reservoir contains 42000 litres of water. Find the depth of the water in the reservoir if its base measures 6m by 3.5m.

37. Find the cost of digging a cuboidal pit 8m long, 6m broad and 3m deep at the rate of Rs 30 per m^3

38. How many bricks of size $22cm \times 10cm \times 7cm$ are required to construct a wall 33m long, 3.5m high and 40cm thick, if cement and sand used in the construction occupy $\frac{1}{10}th$ part of the wall?

39. A water tank built by a municipality of a town to supply water to its 25000 inhabitants at 125 litres per day per person is 40m long and 31.25m broad. The tank, when it is full, can supply water for two days to the inhabitants of the town. Find the dept of the tank.

40. The earth taken out from a pit is evenly spread over a rectangular field of length 90m, width 60m. If the, volume of the earth dug is $3078 \ m^3$. Find the height of the field raised.

41. A rectangular field is 154m long and 121m broad. A well of 14m length and 11m breadth is dug inside the field and mud taken out is spread evenly over the remaining part of the field to a thickness of 25cm. Find the depth of the well.

42. If the rainfall on a certain day was 5cm, how many litres of water fell on 1 hectare field on that day?

43. The length, breadth and height of a cuboidal reservoir is 7m, 6m and 15m respectively. 8400 litre of water is pumped out from the reservoir. Find the fall in the water-level in the reservoir.

44. What is the weight of a cubical block of ice 50cm in length, if one cubic metre of ice weighs 900 kilograms?

45. Find the volume in cubic metre (cu. m) of each of the cuboids whose dimensions are:

$length \ = \ 12m, \ breadth \ = \ 10m, \ height \ = \ 4.5m$

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46. Find the volume in cubic decimetre of each of the cubes whose side is (i)1.5m   (ii) 75cm   (iii) 2dm 5cm

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47. How much clay is dug out in digging a well measuring 3m by 2m by 5m?

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48. What will be the height of a cuboid of volume $168\ m^3,$ if the area of its base is $28\ m^2$?

49. A tank is 8m long, 6m broad and 2m high. How much water can it contain?

50. The capacity of a certain cuboidal tank is 50000 litres of water. Find the breadth of the tank, if its height and length are 10m and 2.5m respectively.

51. A rectangular diesel tanker is 2m long, 2m wide and 40cm deep. How many litres of diesel can it hold?

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52. The length, breadth and height of a room are 5m, 4.5m and 3m, respectively. Find the volume of the air it contains.

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53. A water tank is 3m long, 2m broad and 1m deep. How many litres of water can it hold?

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54. How many planks each of which is 3m long, 15cm broad and 5cm thick can be prepared from a wooden block 6m long, 75cm broad and 45cm thick?

55. How many bricks each of size $25cm \times 10cm \times 8cm$ will be required to build a wall 5m long, 3m high and 16cm thick, assuming that the volume of sand and cement used in the construction is negligible?

56. A village, having a population of 4000, requires 150 litres of water per head per day. It has a tank measuring $20m \times 15m \times 6m$. For how many days will the water of this tank last?

57. A rectangular field is 70m long and 60m broad. A well of dimensions $14m \times 8m \times 6m$ is dug outside the field and the earth dug-out from this well is spread evenly on the field. How much will the earth level rise?

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58. A swimming pool is 250m long and 130m wide. 3250 cubic metres of water is pumped into it. Find the rise in the level of water.

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59. A beam 5m long and 40cm wide contains 0.6 cubic metre of wood. How thick is the beam?

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60. The rainfall on a certain day was 6cm. How many litres of water fell on 3 hectares of field on that day?

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61. An 8m long cuboidal beam of wood when sliced produces four thousand 1cm cubes and there is no wastage of wood in this process. If one edge of the beam is 0.5m, find the third edge.

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62. The dimensions of a metal block are 2.25m by 1.5m by 27cm. It is melted and recast into cubes, each of the side 45cm. How many cubes are formed?

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63. A solid rectangular piece of iron measures 6m by 6cm by 2cm. Find the weight of this piece, if $1cm^3$ iron weighs 8gm.

64. Fill in the blanks in each of the following so as to make the statement true: $1\,m^3 = \quad cm^3$ $1\,litre = \quad ....\quad$ cubic decimetre $1\,kl = ...\,m^3$ The volume of a cube of side 8cm is .... The volume of a wooden cuboid of length 10cm and breadth 8cm is $4000\,cm^3$ The height of the cuboid is .... cm. $1\,cu\dot{d}m = cu\dot{m}m$ $1\,cu\dot{k}m = cu\dot{m}$ $1\,litre = cu\dot{c}m$ $1\,ml = cu\dot{c}m$ $1\,kl = cu\dot{d}m = cu\dot{c}m$

65. Find the surface area of a chalk box whose length, breadth and height are $16cm, 8cm and 6cm$, respectively.

66. Find the surface area of a cube whose edge is 11cm.

67. A cuboidal oil tin is $30 \; cm$ by $40 \; cm$ by $50 \; cm.$ Find the cost of the tin required for making 20 such tines if the cost of tin sheet is $Rs.20$ per square metre.

68. Find the surface area of a cube whose volume is $512m^3$

69. Find the volume of a cube whose surface area is $54 \; cm^2.$

70. The dimensions of a cuboid are in the ratio of $1:2:3:$ and its total surface area is $88m^2$. Find the dimensions.

71. The paint in a certain container is sufficient to paint on area equal to $9.375\ m^2$. How many bricks of dimension $22.5\ cm$ x $10\ cm$ x $7.5\ cm$ can be painted out of this container?

72. The measures of a textbook are $22cm \times 11cm \times 3cm$. It is to be covered with a brown paper. If each book requires $164cm^2$ of more paper for folding how much paper is required to wrap 85 such textbooks ?

73. Find the area of the four walls of a room whose length is $6\,m$, breadth $5\,m$ and height $4\,m$. Also find the cost of white-washing the walls, if the rate of white washing is Rs. $5\,per\;square\;meter.$ (Doors, Windows and other opening ignored)

74. A swimming pool is $20m$ in length, $15m$ in breadth, and $4m$ in depth. Find the cost of cementing its floor and walls at the rate of $Rs12$ per square metre.

75. The floor of a rectangular hall has a perimeter of $250\,m.$ Its height is $6\,m.$ Find the cost of painting its four walls (including doors, etc.) at

the rate of $Rs.6\ per\ square\ metre.$

76. A cuboid has total surface area of the $40\ m^2$ and its lateral surface area is $26\ m^2$. Find the area of its base.

77. Length of a class room is two times its height and its breadth is $1\frac{1}{2}$ times its height. The cost of white-washing the walls at the rate of $Rs.1.60\ per\ m^2$ is $Rs.179.20.$ Find the cost of tiling the floor at the rate of $Rs.6.75\ per\ m^2$

78. Find the surface area of a cuboid whose (i) Length = 10 cm , breadth = 12 cm , height =14 cm (ii) length= 6 dm , breadth = 8d m , height =10 dm (iii)length =2m , breadth = 4m , hieight =5m (iv)length =3. 2m ,breadth = 30 dm , height = 250 cm

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79. Find the surface area of a cube whose edge is 1.2m   (ii) 27cm

(iii) 3cm   (iv) 6m (v) 2.1m

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80. Find the surface area of a cube whose volume is $343m^3$ (ii) $216\ dm^3$

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81. Find the volume of a cube whose surface area is $96 \ cm^2$ (ii) $150 \ m^2$

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82. The dimensions of a cuboid are in the ratio 5:3:1 and its total surface area is $414 \ m^2$. Find the dimensions.

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83. Find the area of the cardboard required to make a closed box of length 25cm, 0.5m and height 15cm.

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84. Find the surface area of a wooden box whose shape is of a cube, and if the edge of the box is 12cm.

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85. The dimensions of an oil tin are $26cm$ x $26cm$ x $45cm$. Find the area of the tin sheet required for making 20 such tins. If 1 square metre of the tin sheet costs Rs. 10, find the cost of tin sheet used for these 20 tines.

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86. A classroom is 11m long, 8m wide and 5m high. Find the sum of the areas of its floor and the four walls (including doors, windows, etc.)

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87. A swimming pool is 20m long 15m wide and 3m deep. Find the cost of repairing the floor and wall at the rate of Rs. 25per square metre.

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88. The perimeter of a floor of a room is 30m and its height is 3m. Find the area of four walls of the room.

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89. Show that the product of the areas of the floor and two adjacent walls of a cuboid is the square of its volume.

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90. The walls and ceiling of a room are to be plastered. The length, breadth and height of the room are 4.5m, 3m and 350cm, respectively. Find the cost of plastering at the rate of Rs. 8 per square metre.

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91. A cuboid has total surface area of $50\ m^2$ and lateral surface area is $30\ m^2$. Find the area of its base.

92. A classroom is 7m long, 6m broad and 3.5m high. Doors and windows occupy an area of $17\ m^2$. What is the cost of white-washing the walls at the rate of Rs. $1.\ 50\ per\ m^2$.

93. The central hall of a school is 80m long and 8m high. It has 10 doors each of size $3m \times 1.\ 5m$ and 10 windows each of size $1.\ 5m \times 1m$. If the cost of white-washing the walls of the hall at the rate of $Rs.1.20\ per\ m^2$ is Rs. 2385.60, find the breadth of the hall.

94. The volume of a cuboid is $440\ cm^3$ and the area of its base is $88\ cm^2$. Find its height.

95. The volume of a cube is $1,000\ cm^3$. Find its total surface area.

96. The dimensions of a metallic cuboid are: $100\ cm \times 80 \times 64\ cm$. It is melted and recast into a cube. Find the surface area of the cube.

97. How many $3\ metre\ cubes$ can be cut from a cuboid measuring $18m\ x\ 12m\ x\ 9m$?

98. A cube of 9cm edge is immersed completely in a rectangular vessel containing water. If the dimensions of the base are 15cm and 12cm, find the rise in water level in the vessel.

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99. The length of a cold storage is double its breadth. Its height is $3\ metres.$ The area of its four walls (including doors) is $108\ m^2.$ Find its volume.

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100. Two cubes each of 10cm edge are joined end to end. Find the surface area of the resulting cuboid.

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101. The sum of length, breadth and depth of a cuboid is $19\ cm$ and length of its diagonal is $11\ cm$. Find the surface area of the cuboid.

102. A plot of land in the form of a rectangle has a dimension $240m\ x\ 180m$. A drainlet $10m$ wide is dug all around it (on the outside) and the earth dug out is evenly spread over the plot, increasing its surface level by $25\ cm$. Find the depth of the drainlet.

103. Three cubes each of side $5cm$ are joined end to end. Find the surface area of the resulting cuboid.

104. Find the number of bricks, each measuring 25 cm, 12.5 cm and 7.5 cm required to construct a wall 6 m long , 5 m high and 50 cm thick, while the cement and sand mixture occupies $\dfrac{1}{20}th$ of the volume of the wall.

105. A metallic sheet is of the rectangular shape with dimensions $48cm\ x\ 36cm$. From each one of its corners, a square of $8cm$ is cut off. An open box is made of the remaining sheet. Find the volume of the box.

106. How many planks each of which is $2m$ long, $2.\,5\ cm$ broad and $4cm$ thick can be cut-off from a wooden block $6m$ long, $15\ cm$ broad and $40cm$ thick?

107. An agricultural field is in the form of a rectangle of length $20m$ and width $14m.$ A pit $6 m long, 3 m wide and 2.5 m deep$ is dug in a corner of the field and the earth taken out of the pit is spread uniformly over the remaining area of the field. Find the extent to which the level of the field has been raised.

108. The length of a hall is $20\ m$ and width $16\ m.$ The sum of the area of the floor and the flat roof is equal to the sum of the areas of the four walls. Find the height and the volume of the hall.

109. The length of a room is one and a half times its breadth. The cost of carpeting the room at $Rs.3.25\ per\ m^2$ is $Rs.175.50$ and the cost of papering the walls at $Rs.1.40\ per\ m^2$ is $Rs.240.80$. If 1 door and 2 window occupy $8\ m^2$, find the dimensions of the room.

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110. A solid cube is cut into two cuboids of equal volumes. Find the ratio of the total surface area of the given cube and that of one of the cuboids.

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111. The external length, breadth and height of a closed rectangular wooden box are 18cm, 10cm and 6cm respectively and thickness of wood is $\frac{1}{2}cm$. When the box is empty, it weight 15kg and when filled

with sand it weighs 100kg. Find the weight of one cubic cm of weed and cubic cm of sand.

112. The outer dimensions of a closed wooden box are $10cm$ by $8cm$ by $7cm.$ Thickness of the wood is $1cm.$ Find the total cost of wood required to make box if $1\ cm^3$ of wood costs $Rs\ 2.\ 00$

113. Find the length of the longest rod that can be placed in a room 12m long, 9m broad and 8m high.

114. If V is the volume of a cuboid of dimensions $a, \ b, \ c \ and \ S$ is its surface area, then prove that $\dfrac{1}{V} = \dfrac{2}{S}\left(\dfrac{1}{a} + \dfrac{1}{b} + \dfrac{1}{c}\right)$

115. The areas of three adjacent faces of a cuboid are x, y and z. If the volume is V, prove that $V^2 = xyz$.

116. A rectangular water reservoir contains $105 \ m^3$ of water. Find the depth of the water in the reservoir if its base measures 12m by 3.5m.

117. Cubes A, B, C having edges 18cm, 24cm and 30cm respectively are melted and moulded into a new cube D. Find the edge of the bigger cube D.

118. The breadth of a room is twice its height, one half of its length and the volume of the room is $512\ cu.dm$. Find the dimensions.

119. A closed iron tank 12m long, 9m wide and 4m deep is to be made. Determine the cost of iron sheet used at the rate of Rs. 5 per metre sheet, sheet being 2 metre wide.

120. A tank open at the top is made of iron sheet 4m wide. If the dimensions of the tank are $12m \times 8m \times 6m$, find the cost of iron sheet at Rs. 17.50 per metre.

121. Three equal cubes are placed adjacently in a row. Find the ratio of total surface area of the new cuboid to that of the sum of the surface areas of the three cubes.

122. The dimensions of a room are 12.5 m by 9m by 7m. There are 2 doors and 4 windows in the room; each door measures 2.5 m by 1.2 m and each window 1.5m by 1 m. Find the cost of painting the walls at Rs. 3.50 per square metre.

123. A field is 150m long and 100m wide. A plot (outside the field) 50m long and 30m wide is dug to a depth of 8m and the earth taken out from the plot is spread evenly in the field. By how much is the level of field raised?

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124. Two cubes, each of volume $512\ cm^3$ are joined end to end. Find the surface area of the resulting cuboid.

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125. Three metal cubes whose edges measure $3cm,\ 4cm\ and\ 5cm$ respectively are melted to form a single cube. Find its edge. Also, find the surface area of the new cube.

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126. The cost of preparing the walls of room 12m long at the rate of Rs. 1.35 per square metre is RS. 340.20 and the cost of matting the floor at 85 paise per square metre is Rs. 91.80. Find the height of the room.

127. The length of a hall is 18m and the width 12m. The sum of the areas of the floor and the flat roof is equal to the sum of the areas of the four walls. Find the height of the hall.

128. A metal cube of edge 12cm is melted and formed into three smaller cubes. If the edges of the two smaller cubes are 6cm and 8cm, find the edge of the third smaller cube.

129. The dimensions of a cinema hall are 100m, 50m and 18m. How many persons can sit in the hall, if each person requires $150m^3$ of air?

130. The external dimensions of a closed wooden box are 48cm, 36cm, 30cm. The box is made of 1.5cm thick wood. How many bricks of size $6cm \times 3cmxx0.75cm$ can be put in this box?

131. The dimensions of a rectangular box are in the ratio 2:3:4 and the difference between the cost of covering it with sheet of paper at the rates of Rs. 8 and Rs. 9.50 per m^2 is Rs. 1248. Find the dimensions of the box.