MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

SURFACE AREA AND VOLUME OF A RIGHT CIRCULAR CYLINDER CONE

Others

1. The diameter of a cone is 14cm and its slant height is 9cm. Find the area of its curved surface.

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2. The radius of a cone is 3cm and vertical height is 4cm. Find the area of the curved surface.

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3. The radius and slant height of a cone are in the ratio of 4:7. If its curved surface area is $792cm^2$, find its radius. $\left(Use\pi = \frac{22}{7}\right)$

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4. The circumference of the base of a 10m high conical tent is 44 metres. Calculate the length of canvas used in making the tent if width of canvas is 2m. $\left(Use\pi = \frac{22}{7}\right)$

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5. How many metres of cloth 5m wide will be required to make a conical tent, the radius of whose base is 7m and whose height is 24m? $\left(Take\pi = \frac{22}{7}\right)$

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6. The lateral surface of a cylinder is equal to the curved surface of a come. If the radius be the same, find the ratio of the height of the cylinder and slant height of the cone.

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7. The radius and height of a cone are in the ratio 4:3. The area of the base is $154cm^2$. Find the area of the curved surface.

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8. A corn cob (see Fig. 13.17), shaped somewhat like a cone, has the radius of its broadest end as 2.1 cm and length (height) as 20 cm. If each $1cm^2$ of the surface of the cob carries an

average of four grains, find how many grains you would find on the entire cob?

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9. A tent is of the shape of a right circular cylinder upt a height of 3 metres and then becomes a right circular cone with a maximum height of 13.5 metres above the ground. Calculate the cost of paintingthe inner side of the tent at the rate of Rs. 2 per square metre, if the radius of the base is 14 metres.

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10. Monica has a piece of Canvas whose area is $551m^2$. She uses it to have conical tent mode, with a base radius of 7m. Assuming that all the stitching margins and wastage incurred while cutting, amounts to approximately $1m^2$. Find the volume of the tent that can be made with it.

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11. If the radius of the base of a cone is halved, keeping the height same, what is the ratio of the volume of the reduced cone to that of the original.

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12. The base radii of two right circular cones of the same height are in the ratio 3:5. Find the ratio of their volumes.

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13. A right triangle ABC with its sides 5 cm, 12cm and 13cm is revolved about the side 12cm. Find the volume of the solid so formed. If the triangle ABC is revolved about side 5cm, then find the volume of the solid so obtained. Find also the ratio of the volumes of the two solids obtained.

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14. A heap of wheat is in the form of a cone of diameter 14m and vertical height 51cm, supposing the material of which it is made weight 10 grams per cubic cm.

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15. A conical tent is to accommodate 11 persons. Each persons must have 4 sq. metres of the space on the ground and 20 cubic

metrs of air to breath. Find the height of the cone.

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16. A semi-circular sheet of metal of diameter 28cm is bent into an open conical cup. Find the depth and capacity of cup.

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17. Two cones have their heights in the ratio 1:3 and the radii of their bases in the ratio 3:1. Find the ratio of their volumes.

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18. A cylinder is within the cube touching all the vertical faces. A cone is inside the cylinder. If heights are some with the same base, find the ratio of their volumes.

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19. A conical tent is 10m high and the radius of its base is 24m. Find the slant height of the tent. If the cost of $1m^2$ convas is Rs. 70, find the cost of the canvas required to make the tent.

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20. Curved surface area of a cone is $308\ cm^2$ and its slant height is 14cm. Find the radius of the base and total surface area of the cone.

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21. There are two cones. The curved surface area of one is twice that of the other. The slant height of the later is twice that of the former. Find the ratio of their radii.

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22. Find the ratio of the surface areas of two cones if their diameters of the bases are equal

and slant heights are in the ratio of 4:3.

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23. Find the ratio of the surface areas of two cones if their diameters of the bases are equal and slant heights are in the ratio of 4:3.

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24. A bus stop is barricaded from the remaining part of the road, by using 50 hollow

cones made of recycled card-board. Each cone has a base diameter of 40cm and height 1m. If the outer side of each of the cones is to be painted and the cost of painting is Rs. 12 per m^2 , what will be the cost of painting all these cones $\left(Use\pi = 3.14 and \sqrt{1.04} = 1.02\right)$

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25. A heap of wheat is in the form of a cone whose diameter is 10.5 m and height is 3 m. Find its volume. The heap is to be covered by

canvas to protect it from rain. Find the area of the canvas required

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26. A tent is in the form of a right circular cylinder surmounted by a cone. The diameter of cylinder is 24m. The height of the cylindrical portion is 11m while the vertex of the cone is 16m above the ground. Find the area of the canvas required for the tent.

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27. The area of the base of a right circular cone is $314cm^2$ and its height is 15cm. Find the volume of the cone.

28. A cylinder and a cone have equal radii of their bases and equal heights. If their curved surface areas are in the ratio 8:5, show that the radius of each is to the height of each as 3:4.

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29. A cone of height 24cm has a curved surface area $550cm^2$. Find its volume. $\left(Take\pi = \frac{22}{7}\right)$

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30. A conical tent is to accommodate 11 persons. Each persons must have 4 sq. metres of the space on the ground and 20 cubic

metres of air to breathe. Find the height of the cone.

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31. A right circular cone is 3.6 cm high and radius of its base is 1.6 cm. It is melted and recast into a right circular cone with radius of its base as 1.2 cm. Find its height.

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32. A conical vessel whose internal radius is 5 cm and height 24 cm is full of water. The water is emptied into a cylindrical vessel with internal radius 10 cm. Find the height to which the water rises.

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33. The volume of a cone is $18480cm^3$. If the height of the cone is 40cm. Find the radius of its base.

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34. The base radii of two right circular cones of the same height are in the ratio 3:5. Find the ratio of their volumes.

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35. From a right circular cylinder with height 10cm and radius of base 6cm, a right circular cone of the same height and base is removed. Find the volume of the remaining solid.

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36. If h, c, V are respectively the height, the curved surface and the volume of a cone, prove that $3\pi V h^3 - C^2 h^2 + 9V^2 = 0$.

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37. A right triangle ABC with its sides 5 cm, 12cm and 13cm is revolved about the side 12cm. Find the volume of the solid so formed.

If the triangle ABC is revolved about side 5cm, then find the volume of the solid so obtained. Find also the ratio of the volumes of the two solids obtained.

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38. A cone of a radius 5 cm is filled with water. If the water poured in a cylinder of radius 10cm, the height of the water rises 2 cm, find the height of the cone.

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39. The diameter of a cone is 14cm and its slant height is 9cm. Find the area of its curved surface.

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40. Find the total surface area of a cone, if its slant height is 9m and the radius of its base is 12m.

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41. The radius of a cone is 3cm and vertical height is 4cm. Find the area of the curved surface.

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42. The radius and slant height of a cone are in the ratio of 4:7. If its curved surface area is $792\ cm^2$, find the radius. $\left(Use\ \pi = \frac{22}{7}\right)$

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43. The circumference of the base of a 10m high conical tent is 44 metres. Calculate the length of canvas used in making the tent if width of canvas is 2m. $\left(Use\pi = \frac{22}{7}\right)$

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44. How many metres of cloth 5m wide will be required to make a conical tent, the radius of whose base is 7m and whose height is 24m? $\left(Take\pi = \frac{22}{7}\right)$

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45. The lateral surface of a cylinder is equal to the curved surface of a come. If the radius be the same, find the ratio of the height of the cylinder and slant height of the cone.

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46. The radius and height of a cone are in the ratio 4:3. The area of the base is $154cm^2$. Find the area of the curved surface.

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47. A corn cob (see in figure), shaped somewhat like a cone, has the radius of its broadest end as 2.1 cm and length as 20cm. If each $1\ cm^2$ of the surface of the cob carries an average of four grains, find how many grains you would find on the entire cob?

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48. A tent is of the shape of a right circular cylinder upt a height of 3 metres and then becomes a right circular cone with a maximum height of 13.5 metres above the ground. Calculate the cost of paintingthe inner side of the tent at the rate of Rs. 2 per square metre, if the radius of the base is 14 metres.

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49. Find the curved surface area of a cone, if its slant height is 60cm and the radius of its base is 21cm.

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50. The radius of a cone is 5cm and vertical height is 12cm. Find the area of the curved surface.

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51. The radius of a cone 7cm and area of curved surface is $176\,cm^2$. Find the slant height.

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52. The height of a cone is 21cm. Find the area of the base if the slant height is 28cm.

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53. Find the total surface area of a right circular cone with radius 6cm and height 8cm.

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54. Find the curved surface area of a cone with base radius 5.25cm and slant height 10cm.

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55. Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m.

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56. The area of the curved surface of a cone is $60\pi\ cm^2$. If the slant height of the cone be 8cm, find the radius of the base.

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57. The radius and slant height of a cone are in the ratio of 4:7. If its curved surface area is $792cm^2$, find its radius. $\left(Use\pi = \frac{22}{7}\right)$

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58. A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.

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59. Find the ratio of the surface areas of two cones if their diameters of the bases are equal and slant heights are in the ratio of 4:3.

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60. There are two cones. The curved surface area of one is twice that of the other. The slant height of the later is twice that of the former. Find the ratio of their radii.

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61. The diameters of two cones are equal. If their slant heights are in the ratio 5:4, find the ratio of their curved surfaces.

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62. Curved surface area of a cone is $308\ cm^2$ and its slant height is 14cm. Find the radius of the base and total surface area of the cone.

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63. The slant height and base diameter of a conical tomb are 25m and 14m respectively. Find the cost of white-washing its curved surface at the rate of Rs. 210 per $100\ m^2$

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64. A conical tent is 10m high and the radius of its base is 24m. Find the slant height of the tent. If the cost of $1m^2$ canvas is Rs. 70, find

the cost of the canvas required to make the tent.

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65. A tent is in the form of a right circular cylinder surmounted by a cone. The diameter of cylinder is 24m. The height of the cylindrical portion is 11m while the vertex of the cone is 16m above the ground. Find the area of the canvas required for the tent.

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66. A circus tent is cylindrical to a height of 3 metres and conical above it. If its diameter is 105m and the slant height of the conical portion is 53m, calculate the length of the canvas 5m wide to make the required tent.

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67. The circumference of the base of a 10m high conical tent is 44 metres. Calculate the

length of canvas used in making the tent if width of canvas is 2m. $\left(Use\pi = \frac{22}{7}\right)$

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68. What length of tarpaulin 3m wide will be required to make a conical tent of height 8m and base radius 6m? Assume that the extra length of material will be required for stitching margins and wastage in cutting is approximately 20 cm $(Use\ \pi = 3.14)$

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69. A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled card-board. Each cone has a base diameter of 40cm and height 1m. If the outer side of each of the cones is to be painted and the cost of painting is Rs. 12 per m^2 , what will be the cost of painting all these cones $\left(Use\pi = 3.14 and \sqrt{1.04} = 1.02\right)$

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70. A cylinder and a cone have equal radii of their bases and equal heights. If their curved surface areas are in the ratio 8:5, show that the radius of each is to the height of each as 3:4.

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71. Find the volume of a right circular cone 1.02m high, if the radius of its base is 28m.

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72. The area of the base of a right circular cone is $314cm^2$ and its height is 15cm. Find the volume of the cone.

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73. The diameter of a right circular cone is 8cm and its volume is $48\ \pi\ cm^3$. What is its height?

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74. The volume of a cone is $18480cm^3$. If the height of the cone is 40cm. Find the radius of its base.

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75. The base radii of two right circular cones of the same height are in the ratio 3:5. Find the ratio of their volumes.

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76. A right circular cone is 3.6 cm high and radius of its base is 1.6 cm. It is melted and recast into a right circular cone with radius of its base as 1.2 cm. Find its height.

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77. A conical vessel whose internal radius is 5 cm and height 24cm is full of water. The water is emptied into a cylindrical vessel with

internal radius 10cms. Find the height to which the water rises.

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78. A right triangle ABC with its dies 5cm, 12cm and 13cm is revolved about the side 12cm. Find the volume of the solid so formed. If the triangle ABC is revolved about side 5cm, then find the volume of the solid so obtained. Find also the ratio of the volumes of the two solids obtained.

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79. A cone and a cylinder are having the same base. Find the ratio of their heights if their volumes are equal.

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80. A cone of a radius 5cm is filled with water. If the water poured in a cylinder of radius 10cm, the height of the water rises 2cm, find the height of the cone.

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81. A solid cube of side 7cm is melted to make a cone of height 5cm, find the radius of the base of the cone.

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82. From a right circular cylinder with height 10cm and radius of base 6cm, a right circular

cone of the same height and base is removed.

Find the volume of the remaining solid.

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83. The radius and height of a cone are in the ratio 3:4. If its volume is $301.44\ cm^3$, what is its radius? What is its slant height? $(Take\ \pi = 3.14)$

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84. If h, c, V are respectively the height, the curved surface and the volume of a cone, prove that $3\pi V h^3 - C^2 h^2 + 9V^2 = 0.$

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85. A cone of height 24cm has a curved surface area $550\, cm^2.$ Find its volume. $\left(Use\ \pi = \frac{22}{7}\right)$

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86. A conical tent is to accommodate 11 persons. Each persons must have 4 sq. metres of the space on the ground and 20 cubic metres of air to breath. Find the height of the cone.

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87. A semi-circular sheet of metal of diameter 28cm is bent into an open conical cup. Find the depth and capacity of cup.

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88. A conical tent is 9m high and the radius of its base is 12m. (i) What is the cost of the canvas required to make it, if a square metre canvas costs Rs. 10? (ii) How many persons can be accommodated in the tent, if each person requires 2 square metre on the ground and 15 m^3 of space to breath in?

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89. Find the volume of the larges right circular cone that can be cut out of a cube whose edge is 9cm.

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90. A cylinder is within the cube touching all the vertical faces. A cone is inside the cylinder. If their heights are same with the same base, find the ratio of their volumes.

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91. Find the volume of a right circular cone with: (i) radius 6cm, height 7cm. (ii) radius 3.5 cm, height 12cm (iii) height 21cm and slant height 28cm.

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92. Find the capacity in litres of a conical vessel with (i) radius 7 cm, slant height 25 cm (ii) height 12 cm, slant height 13 cm

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93. Two cones have their heights in the ratio 1:3 and the radii of their bases in the ratio 3:1. Find the ratio of their volumes.

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94. The radius and the height of a right circular cone are in the ratio 5:12. If its volume is 314 cubic metre, find the slant height and the radius $(Use\ \pi = 3.14)$

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95. The ratio of volumes of two cones is 4:5 and the ratio of the radii of their bases is 2:3. Find the ratio of their vertical heights.

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96. A cylinder and a cone have equal radii of their bases and equal heights. Show that their volumes are in the ratio 3:1.

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97. If the radius of the base of a cone is halved, keeping the height same, what is the ratio of the volume of the reduced cone to that of the original.

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98. A heap of wheat is in the form of a cone of diameter 9m and height 3.5m. Find its volume.

How much canvas cloth is required to just cover the heap? $(Use\ \pi = 3.14)$

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99. Find the weight of a solid cone whose base is of diameter 14cm and vertical height 51cm, supposing the material of which it is made weighs 10 grams per cubic cm.

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100. A right angled triangle of which the sides containing the right angle are 6.3 cm and 10cm in length, is made to turn round on the longer side. Find the volume of the solid, thus generated. Also, find its curved surface area.

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101. Find the volume of the largest right circular cone that can be fitted in a cube whose edge is 14cm.

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102. The volume of a right circular cone is 9856 cm^3 . If the diameter of the base is 28cm, find: (i) height of the cone (ii) slant height of the cone (iii) curved surface area of the cone.

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103. A conical pit of top diameter 3.5m is 12m deep. What is its capacity in kilolitres?

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104. Monica has a piece of Canvas whose area is $551m^2$. She uses it to have conical tent mode, with a base radius of 7m. Assuming that all the stitching margins and wastage incurred while cutting, amounts to approximately $1m^2$. Find the volume of the tent that can be made with it.

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105. The height of a cone is 15cm. If its volume is $500\pi\ cm^3$, then find the radius of its base.

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106. If the volume of a right circular cone of height 9 cm is $48\pi cm^3$, find the diameter of its base.

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107. If the height and slant height of a cone are 21cm and 28cm respectively. Find its volume.

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108. The height of a conical vessel is 3.5cm. If its capacity is 3.3 litres of milk. Find the diameter of its base.

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109. The radius and slant height of a cone are in the ratio of 4:7. If its curved surface area is $792\ cm^2$, find the radius. $\left(Use\ \pi = \frac{22}{7}\right)$

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110. Find the area of canvas required for a conical tent of height 24m and base radius 7m.

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111. Find the area of metal sheet required in making a closed hollow cone of base radius 7cm and height 24cm.

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112. Find the length of cloth used in making a conical pandal of height 100m and base radius 240m, if the cloth is 100π m wide.

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113. The number of surfaces of a cone has, is

(a) 1 (b) 2 (c) 3 (d) 4

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114. The area of the curved surface of a cone of radius 2r and slant height $\frac{l}{2}$ is a) πrl b)$2\pi rl$ c) $\frac{1}{2}\pi rl$ d)$\pi(r+l)r$

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115. The total surface area of a cone of radius $\frac{r}{2}$ and length $2l$, is a)$2\pi r(l+r)$b) $\pi r\left(l+\frac{r}{4}\right)$ c)$\pi r(l+r)$ d)$2\pi rl$

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116. A solid cylinder is melted and cast into a cone of same radius. The heights of the cone and cylinder are in the ratio (a) 9:1 (b) 1:9 (c) 3:1 (d) 1:3

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117. The slant height of a cone is increased by 10%. If the radius remains the same, the curved surface area is increased by (a) 10%

(b) 12.1% (c) 20% (d) 21%

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118. The height of a solid cone is 12cm and the area of the circular base is $64\pi cm^2$.A plane parallel to the base of the cone cuts through the cone 9cm above the vertex of the cone ,the

area of the base of the new cone so formed is

a)$9\pi cm^2$ b)$16\pi cm^2$ c)$25\pi cm^2$ d)$36\pi cm^2$

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119. If the radius of the base of a right circular cone is $3r$ and its height is equal to the radius of the base, then its volume is (a) $\frac{1}{3}\pi r^3$ (b) $\frac{2}{3}\pi r^3$ (c)$3\pi r^3$ (d)$9\pi r^3$

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120. If the volumes of two cones are in the ratio 1:4 and their diameters are in the ratio 4:5, then the ratio of their heights, is (a) 1:5 (b) 5:4 (c) 5:16 (d) 25:64

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121. The curved surface area of one cone is twice that of the other while the slant height of the latter is twice that of the former. The

ratio of their radii is (a) 2:1 (b) 4:1 (c) 8:1 (d) 1:1

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122. If the height and radius of a cone of volume V are doubled, then the volume of the cone, is (a) 3 V (b) 4 V (c) 6 V (d) 8 V

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123. The ratio of the volume of a right circular cylinder and a right circular cone of the same base and height, is (a) 1:3 (b) 3:1

(c) 4:3 (d) 3:4

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124. A right circular cylinder and a right circular cone have the same radius and the same volume. The ratio of the height of the

cylinder to that of the cone is (a) 3:5 (b) 2:5 (c) 3:1 (d) 1:3

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125. If the base radius and the height of a right circular cone are increased by 20%, then the percentage increase in volume is approximately. (a) 60 (b) 68 (c) 73 (d) 78

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126. The diameters of two cones are equal. If their slant heights are in the ratio 5:4, find the ratio of their curved surfaces.

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127. If h, $S\,and\,V$ denote respectively the height, curved surface area and volume of a right circular cone, then $3\pi Vh^3 - S^2h^2 + 9V^2$ is equal to (a) 8 (b)0(c) 4π(d)$32\pi^2$

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128. If a cone is cut into two parts by a horizontal plane passing through the mid-point of its axis, the ratio of the volumes f upper and lower part is (a) 1:2 (b) 2:1 (c) 1:7 (d) 1:8

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129. If the heights of two cones are in the ratio of 1:4 and the radii of their bases are in the

ratio 4:1, then the ratio of their volumes is (a) 1:2 (b) 2:3 (c) 3:4 (d) 4:1

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