MATHS

BOOKS - CALCUTTA BOOK HOUSE

MATHS (BENGALI ENGLISH)

RIGHT CIRCULAR CONE

Examples

1. The ratio of the volumes of two right circular cones is $1:4$ and the ratio of their lengths of

radii of the bases is $4:5$ then the ratio of their heights is

A. $1:5$

B. $5:4$

C. $25:16$

D. $25:64$

Answer:

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2. If keeping the length of radius of a right circular cone fixed , the height of it is increased by 2 times , then the volume of cone will by increased by

A. $100\ \%$

B. $200\ \%$

C. $300\ \%$

D. $400\ \%$

Answer:

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3. If each of the radius and height circular cone be doubled , then the volume of the cone will be

A. 3 times

B. 4 times

C. 6 times

D. 8 times

Answer:

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4. If the length of radius of a right circular cone be $\frac{r}{2}$ unit and its slant height be $2l$ unit , the total surface area of if will be

A. $2\pi r(l+r)$ sq- unit

B. $\pi r\left(1+\frac{r}{4}\right)$ sq-unit

C. $\pi r(l+r)$ sq-unit

D. 2πrl sq-unit

Answer:

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5. If a triangle of sides 6 cm , 8cm be rotated keeping the side of length 8 cm fixded, then the volume of the cone thus produced will be

A. $96\pi cc$

B. $120\pi cc$

C. $128\pi cc$

D. $200\pi cc$

Answer:

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6. The area of the base of a right - circular cone is 25 sq - cm and the hieght is 10 cm . Then the volume of the cone will be

A. $\frac{150}{3}cc$

B. $\frac{250}{3}cc$

C. $\frac{350}{3}cc$

D. $\frac{400}{3}cc$

Answer:

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7. If the numerical values of the area of the base and the volume of a right circular cone of radius 4cm be equal , then the slant height of the cone is

A. 3cm

B. 4cm

C. 5cm

D. 6cm

Answer:

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8. If the height of a right circular cone be increased by 10% keeping its radius fixed , then the volume of the cone will be

A. 5%

B. 10%

C. $15\ \%$

D. $20\ \%$

Answer:

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9. The volume of a right circular conical tent is $1232cc$. If the height of the tent be 24 metres, the area of the base of the cone will be .

A. 140sq-m

B. 145sq-m

C. 154sq-m

D. 160sq-m

Answer:

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10. The difference of the square of the height and the square of the base of a right circular cone of slant height 10 cm is 28cm, then the volume of the cone will be

A. $43\pi cc$

B. $54\pi cc$

C. $72\pi cc$

D. $96\pi cc$

Answer:

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11. If the radius of the base of a right circular cone by halved and its height be doubled ,

then the volume of the cone remains the same.

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12. The slant height of a right circular cone is always greater than the height of the cone.

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13. Among the total surface area , lateral surface area and the area of the base of right

circular cone , the total surface area is the greatest in magnitude.

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14. State true or false- If the area of the base of a right circular cone be 3 times of its volume , then the height of it will 1 unit .

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15. If the area of the base of a right circular cone be x sq-unit and the volume be y cubic - unit, then the height of the cone will be $\frac{3y}{x}$ unit.

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16. Find the hypotenuses of an isosceles right triangle whose side is $8\sqrt{2}$ cm.

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17. If the volume of a right circular cone be V cubic - unit and the area of the base be A sq-unit , then the height of the cone is _____.

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18. The number of surfaces of a closed right circular cone is_____.

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19. The number of vertices of a right circular cone is _____.

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20. The lateral surface area of a right circular cone = (Total surface area)=_____.

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21. The height of a right circular cone is 12 cm and its volume is $100\pi cc$, then find the radius

of the cone.

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22. The curved surface area of a right circular cone is $\sqrt{5}$ times of its base area . Find the ratio of the height and the length of radius of the cone.

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23. If the volume of a right circular cone is V cubic- unit , base area is A sq- unit and height is H unit , then find the value of $\frac{AH}{V}$.

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24. The numerical values of the volume and the lateral surface area of a right circular cone are equal. If the height and the radius of the cone are h unit and r unit respectively , then find the value of $\frac{1}{h^2}+\frac{1}{r^2}$.

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25. The ratio of the lengths of the radii of the bases of a right circular cylinder and of a right circular cone is $3:4$ and the ratio of their heights is $2:3$, Find the ratio of the volumes of the cylinder and the cone.

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26. The ratio of the radius of the base of a right circular cone and its height is $3:7$, The

volume of the cone is 528c c . Fin the diameter of the cone.

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27. The radius of a right circular cone is 7 cm at its vertical angle is 60°. Find the curved surface area of the cone.

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28. If the height and the area of base of a right circular cone be increased by 4 times, then how many times the volume of the cone will be increased ?

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29. The curved surface area of a right circular cone is $\sqrt{2}$ times of the area of the base. Then what is the vertical angle of the cone ?

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30. The area of bases of two right circular cones are equal. If the ratio of the slant heights be $2:3$, then what will be the ratio of their curved surface areas ?

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31. If the height and slant height of a cone are 6 cm and 10 cm respecitvely. Then determine the total surface area and the volume of the cone.

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32. 77 sq-cm tripal is required to make a right circular conical tent. If the slant height of the tent is 7m, then calculate the base area of the tent.

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33. The length of the base diameter of a wooden toy of conical shape uis 10 cm . The

expenditure for polishing whole surfaces of the toy at the raye of rupees 2.10 per square - metre is rupees 429. Calculate the height of the toy. Also determine the quantity of wood which is required to make the toy.

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34. The quantity of iron - sheet to make a boy a of right circular conical shape is $75\frac{3}{7}$ sq-m. if the slant height of it 5 m, then calculate the volume of air in the boya and its height.

Determine of the expenditure to colour the whole surface of the boya at the rate of rupees 2.80 per square - metres. [The width of the iron - sheet not to be considered while calculating.]

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35. In a right circular conical tent 11 persons can stay. For each person 4 sq-m space in the base and $20m^3$ air are neccessary. Determine

the height of the tent put up exactly for 11 persons.

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36. The external diameter of a conical - coronet made off thermocol is 21 cm is length . To wrap up the outer surface of the coronet with foil , the expenditure will be rupees 57.75 at the rate of 10p per $-m^2$. Calculate the height and slant height of the coronet

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37. The base area of a right circular cone is 21m and height is 14m . Calculate the expenditure to colour the curved surface at the rate of rs. 1.50 per sq.m.

38. The shape of a heap of wheat is a right circular cone, the diameter of base of which is 9 metres and height is 3.5 metres. Find the volume of the heap of wheat. How much sq-

metre of plastic sheet will be needed to cover that heap of wheat ? [Given that $\pi = 3.14$ and $\sqrt{130} = 11.4$].

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39. What will be the height of the cone of radius 12 cm if a solid cone is made by melting a solid coneof radius of base 6 cm and of slant height 10 cm ?

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40. What changes will be occured in the volume of a right circualr cone if its radius be increased by 10% and its height be decreased by 10% ?

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41. If the whole surface area of a right circular cone be 3696 sq-cm and the ratio of its radius of base and height be $3:4$, then what will be the curved surface area of the cone ?

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42. If the curved surface area of a toy of shaped a right circular cone of height 24 cm is 550 sq-cm , then what be the volume of the toy ?

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43. The volume of a right circular cone is $410\frac{2}{3}cc.$ If the radius of the base of the cone

be 14 cm , then what will be the curved surface area of the cone ?

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44. What changes will be occured in the height of a right circular cone if its radius of base is decreased by 50% and its volaume be decreased by 25% ?

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45. What changes in curved surface area of a right circular cone will be occured if its radius of base and height is doubled ?

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46. If the curved surface area , volume height and semi- vertical angle of a right circular cone be S,V ,h and α respectively , then prove that $S = \frac{\pi h^2 \sin a}{\cos^2 a}$ and $V = \frac{1}{3}\pi h^3 \tan^3 \alpha$.

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47. If the height , curved surface area and volume of a right circular cone be h, c and v respectively , then that $3\pi vh^3 - c^2h^2 + 9v^2 = 0.$

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48. The height of a right circular cone is 30 cm . A small part of the cone is cut off from the above part of the cone with the help of a plane parallel to the base of the cone. If the

volume of the small part be $\frac{1}{27}$ part of the volume of the original cone , then at what distance above the base of the cone , it has been cut off ?

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49. The lengths of the adjacent sides of right angle of a right - angled triangle are 20 cm and 15cm. What will be the total volume of the two right circular cones when this triangle is rotated with its hypotenuse taken as the axis ?

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Exercise 1

1. The diameter of the base of a right circular cone is 6 cm and height is 4 cm . Then the curved surface area of the cone is

A. 15π sq-cm

B. 30π sq-cm

C. 40 sq-cm

D. 55 sq-cm

Answer: A

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2. The ratio of the radius of the base and height of a right circular cone is $5:12$. If the volume of the cone be $314\frac{2}{7}cc$ then the slant height of the cone will be

A. 13 cm

B. 14 cm

C. 17 cm

D. 26 cm

Answer: A

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3. The ratio of the heights of two right circular cones is $1:3$ and the ratio of their diameters of bases is

A. $1:5$

B. $5:9$

C. $3:25$

D. $6:13$

Answer: C

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4. The height of a right circular cone and its diameter of base equal, then the ratio of whole surface area and curved surface area will be

A. $\frac{1}{\sqrt{5}}:1$

B. $\frac{1}{\sqrt{2}}:1$

C. $1:\frac{1}{\sqrt{5}}$

D. $1:\frac{1}{\sqrt{2}}$

Answer: C

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5. If the area of the base of a right circular cone be $4\pi r^2$ sq-cm and height be 3 cm , then the volume of the cone will be

A. $12\pi r^2 cc$

B. $\frac{4}{3}\pi r^2 hcc$

C. $\frac{4}{9}\pi r^2 hcc$

D. $4\pi r^2 cc$

Answer: D

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6. The ratio of the diameters of the bases of two right circular cones is $2:3$ and if the ratio

of their volumes be $2:3$, then the ratio of their heights will be

A. $2:3$

B. $3:2$

C. $4:9$

D. $9:4$

Answer: A

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7. If the height of a right circular cone be 4.8 cm and its diameter of base 4 cm, then the slant height of the cone will be

A. $4.2cm$

B. $5.2cm$

C. $6.2cm$

D. $7.2cm$

Answer: B

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8. If the circumference of the base of a right circular cone be $\frac{264}{7}cm$ and its slant height be 10 cm , then the volume of the cone will be

A. $288\pi cc$

B. $276\pi cc$

C. $292\pi cc$

D. $302\pi cc$

Answer: A

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9. The radius of base and height of a right cone are equal . Keeping radius constant , if the slant height of the cone is increased by $\sqrt{2}$ times , then the relation between height and radius will be

A. height = radius

B. height $= \sqrt{2} \times$ radius

C. height $= \sqrt{3} \times$ radius

D. height $= 2 \times$ radius

Answer: C

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10. If the total surface area of a right circular cone of radius 3cm be 24π sq-cm, then its volume will be .

A. $25\pi cc$

B. $30\pi cc$

C. $32\pi cc$

D. $36\pi cc$

Answer: D

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11. The curved surface area of a right circular cone of height h unit and radius of base r unit is $\pi r\sqrt{h^2+r^2}$ unit .

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12. If the whole surface area of a right circular cone be A_1 sq- unit andif its curved surface

area be A_2 sq-unit, then the area of the base is $(A_1 - A_2)$ sq-unit.

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13. If the radius of base and height of a right circular cone be increased by 3 times , then the volume of the cone will be increased by 27 times.

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14. The slant height of a right circular cone of radius of base 4 unit and of height 3 unit is 6 unit.

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15. The curved surface area of a right circular cone of height 3 times of its radius and of slant height 10 unit will be $10\sqrt{10}\pi$ sq-unit.

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16. The length of slant height of a right circular cone is always greater than the length of its height .

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17. Between the 2 surfaces of a closed right circular cone, the one is plane surface and the other is a curved surface.

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18. The base of a right circular cone may not be circular.

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19. if the height and the radius of base of a right circular cone be equal , then the ratio of height and slant height will be $1:\sqrt{2}$.

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20. The volume of a right circular cone of radius of base r unit and of height h unit is $\frac{1}{3}\pi r^2 h$ cubic-unit.

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21. If the vertical angle of a right circular cone be α and its radius of base be r unit, then the height of the cone will be _____.

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22. If a right- angled triangle is rotated at an angle of _____ with its hypotenuse as the axis , then a right circular cone is produced.

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23. The line segment joining the vertex of a right circular cone and the centre of the circular base of it will be _____on its base - plane.

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24. The curved surface area of a right circular cone = _____ $\times$ slant height .

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25. The whole surface area of a right circular cone = half of the circumference of the base of the cone x _____

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Exercise 2

1. If the volume of a right circular cone be 450 c c and the area of its base be 150 sq-cm, then what will be the height of the cone ?

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2. The ratio of the radius of base of a right circular cone and its height is $3:4$. If the volume of the cone be $301\frac{5}{7}cc$, then what will be the height of the cone ?

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3. The slant height of a right circular cone is 3 times of its radius of base . If the whole surface area of the cone be 50.24sq-cm, then what will be the height of the cone ?

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4. The sum of the slant height and radius of base of a right circular cone is 16 cm. If the

height of the cone be 8 cm , then what will be the slant height of the cone ?

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5. If the vertical angle of aright circular cone be 60° and its diameter of base be 14 cm , then what will be the curved surface area of the cone ?

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6. The ratio of the radii of bases of two right circular cones of equal heights is $5:6$. Then what will be the ratio of their volumes ?

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7. The ratio of the curved surface areas of two right circular cones of equal slant heights is $2:3$. Then what will be the ratio of their areas of bases of the two cones ?

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8. The slant height of a pot of shaped a right circular cone is 130 cm and if the diameter of the base be 100 cm , then how much litres of water will contain in the pot ? $(\pi = 3.14)$

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9. The numerical value of the whole surface area of a right circular cone and the volume are equal. If the slant height , height and radus of base of the cone be l unit , h , unit

and r unit respectively , then prove that $9h = r^2(h - 6)$.

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10. How many times the whole surface area of a right circular cone will be increased when the radius of base and slant height of the cone be both doubled ?

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Exercise 3

1. The volume of a right circular cone is 1232 c c . If the diameter of the base cone be 28 cm , then what will be the curved surface area of the cone ?

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2. The ratio of the radius of base and height of a right circular cone is $4:3$, if the area of the

base of the cone be 154 sq-cm, then what will be the curved surface area of the cone ?

3. The radius of base and height of a right circular cone - shaped pot are 21 cm and 28 cm respectively , Then what will be the curved surface area , whole surface area and volume of the pot ?

4. The ratio of the radius and slant height of a right circualr cone $4:7$. If the curved surface area of the cone be 792 sq-cm, then will be the volume of the cone ?

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5. The circumference of the base of a right circular cone - shaped tent is 88 metres and its height is 2 metres. How many length of the canvas will be required to cover the tent if the

breadth of the canvas be 2 metres ? $(\sqrt{2} = 1.414)$.

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6. The sides of a right angled triangle are 20 cm , 16 cm and 12 cm respectively . Find the total volume of the two cones produced by rotating the triangle with its hypotenuse as axis.

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7. A conical tent is required to accommonate 5 people each person must have 16 sq-ft of space on the ground and 100 cubic -ft or air to breathe . Find out the vertical height and slant height of the tent.

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8. The external diameter of the base of a right circular cone - shaped wooden toy is 10 cm. The expenditure of colouring the total surface area on the outside of it at the rate of rs 0.07

per sq-cm is rs 19.80 Find the slant height of the toy.

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9. If the volume , height and semi - vertical angle of a right circular cone be v,h and α respectively, then prove that $3v \tan \alpha = \pi r^3$, where r= radius of base.

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10. A right circular cone of height 20 cm is divided into two parts by a plane surface through its midpoint of the axis and at right angle with it . If the radius of base of the intial cone be 4 cm , then find the volume of the split cone.

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11. 25 small metal cones of radius 6 cm each are made by melting a large right circular cone

of radius 15 cm and of height 20 cm . Find the height of the small cones.

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12. The height of three right circular cones of radii 3 cm , 4 cm and 5 cm respectively is 10 cm . If a large metal cone of diameter 20 cm is made by melting those three small cones , then what will be the height of the large cone ?

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13. The ratio of the height and radius of base of a right circular cone is $4:3$. What changes will be occured in the total surface area of the cone if its height and radius of base be doubled ?

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14. How many percentage of the volume of a right circular cone will be increased or

decreased if its radius of base is increased by 20% and its height is decreased by 10% ?

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