1. A town's water reservoir is in the shape of a cube and has a total area of 96m². If they changed the shape of the reservoir to a sphere with the same volume as the cube, what would be the surface area of this new water reservoir?

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2. A factory makes containers for glue. The containers can be of any shape but must have a volume of 729cm³. If the material to make the containers costs $0.03 per centimeter squared, find the minimum cost of making 800 containers.

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3. Find the minimum total area of a spherical solid with a volume of 128m³.

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4. A glass factory makes display cases in the shape of rectangular prisms. The cases need to have a volume of 27m³. If the material to make the cases costs $15 per square meter, find the minimum cost of making 550 cases.

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5. We have a piece of cardboard to either make a rectangular prism with the ratio of width, length and height as 1:2:3; or, simply make a cube. By what percent is the volume of the cube larger than the rectangular prism?
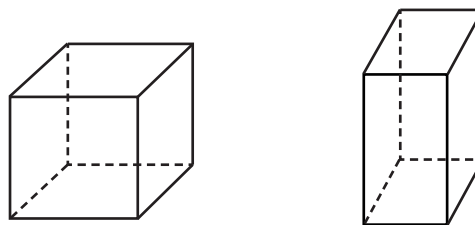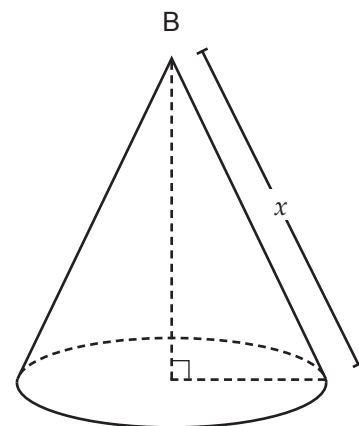

Width : Length: Height = 1 : 2 : 3

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6. The two cones below are similar. The volume of the larger cone is 125 times the volume of the smaller cone. Given information in diagrams, what is the slant height of the larger one?


A

12 m

5 m
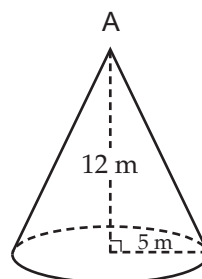
Height = 12 m
Radius = 5 m

B

x

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7. Harry filled two similar cylindrical water tanks at his house. To fill the smaller tank with a height of 21 cm, he used 27 buckets of water; to fill the larger tank (that has an area of its base of 1525 cm²), he used 64 buckets of water. How many cm³ of water does his bucket hold?

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8. Given that the prisms below are similar, find the volume of the larger prism using the information given below.

A
h = 40 m
Area of Base = 250 m²

B
Area of Base = 1000 m²

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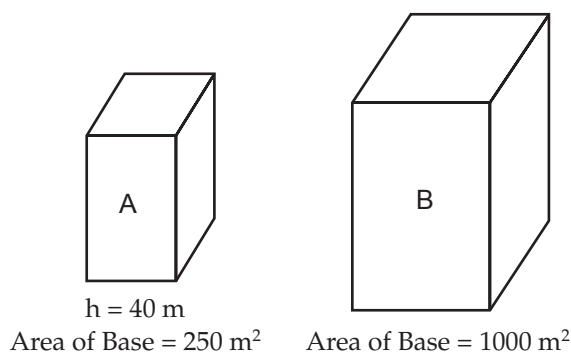
9. Cylinders A and B are similar. The height of the cylinder A is 20m and its diameter is 10m. The total area of cylinder B is 36 times that of cylinder A. What is the volume of cylinder B?

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10. The ratio of the total surface areas of two similiar cones is $\frac{9}{16}$, what is the ratio of the slant heights?

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11. A cone and a cylinder with the same height of 10m are equivalent. What is the radius of the cone if the radius of the cylinder is 4m?

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12. The cylinder and the cone given in the diagram below are equivalent. Given the information below, what is the height of the cylinder?
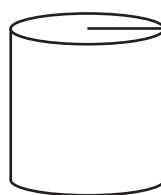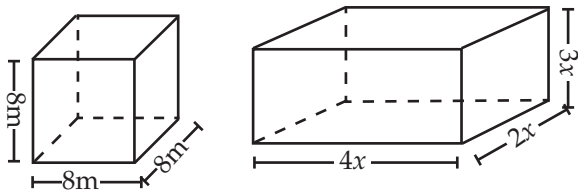

Radius = 3m
Height = ?
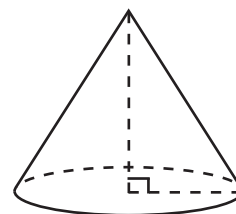
Radius = 5m
Height = 7m

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13. In the diagram below the rectangular prism and the cube are equivalent. Given the information in the diagrams, solve for x and state the numerical dimensions for the rectangular prism.

14. The diagram given in the question is composed of a right prism topped by a right pyramid. The base of the prism and the base of a pyramid are isometric squares. The prism and the pyramid are equivalent in volume. The sum of the volumes of the two solids is 1080m^3. If the edges of the base of the prism measure 6 m each, what is the total height of the diagram below?
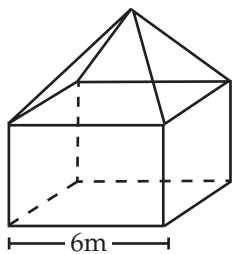
15. The cube and the rectangular prism in the diagram below are equivalent. Given the information in the diagrams, what is the total surface area of the rectangular prism?
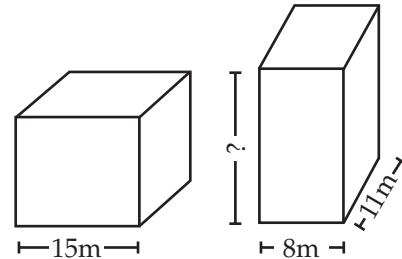
16. Find the greatest area of a triangle with a perimeter of 45cm.

17. Brian has 80 m of fence to make a rectangular play area for his children in his back yard. Given that Brian has several acres of land in his back yard, what is the maximum area that he can fence off for his children?

18. Nancy wants to make a pen for her pet rabbit and needs 36m² of space in her barn. She wants the pen to be in the shape of a triangle. What is the minimum length of fence that she must use to border her rabbit's pen?

19. How much more area can be enclosed with a 42cm string made into the shape of a circle instead of square?

20. Sarah has to fence off 400m² for a soy bean field. Find the minimum length of fence to make the enclosure.