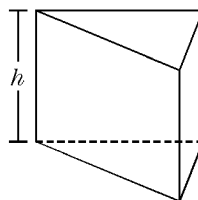


Honors Math 3
Volume Worksheet

1. A rectangular box has one of its dimensions quadrupled while the other two dimensions are both halved. What does this do to its volume?

2. The right triangular prism shown has bases that are equilateral triangles. The height h of the prism is $2\sqrt{3}$ and the base edges each measure 4. Find the exact volume of the prism.

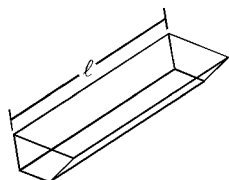


3. A right triangular prism has a height of 20. Its bases are isosceles triangles with side lengths of 25, 25, and 14. Find the volume of the prism.

4. A toy box is shaped like a rectangular prism. Its dimensions are 80 cm high by 100 cm long by 60 cm wide. The box is used to store a child's building blocks. The blocks are 4 cm thick, 10 cm long, and 5 cm wide. How many blocks will fit into this box?

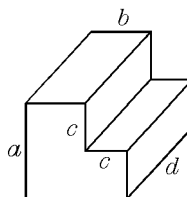
5. In the diagram, a rain gutter with a length ℓ of 25 feet is shown. The end pieces are congruent trapezoids with surface areas of 30 in^2 each.

- a) If the rain gutter plugs up, what will be the volume of the water the gutter contains before it starts to overflow?
- b) If water weighs 62.4 lbs per cubic foot, how much will this water in the gutter weigh?

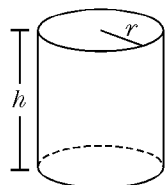


6. In the diagram, concrete steps are shown with dimensions $a = 20 \text{ in.}$, $b = 10 \text{ in.}$, $c = 6 \text{ in.}$, and $d = 24 \text{ in.}$ What is the amount of concrete needed to create these steps

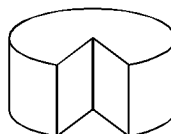
- a) in cubic inches?
- b) in cubic feet?
- c) in cubic yards (to the nearest tenth)?



7. The right circular cylinder shown in the diagram has a height of 5 cm and a radius of 2 cm. What is the volume of this cylinder?

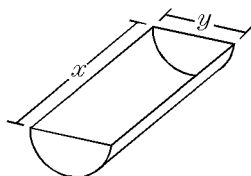


8. In the diagram, a cylindrical cake has a 45° slice removed from it. The cake is 5 inches high and has a radius of 8 inches. What is the volume of the remaining cake?



Honors Math 3
Volume Worksheet

9. A semicircular trough is shown. If $x = 4$ m and $y = 0.8$ m, how many cubic meters of fluid will this trough hold?

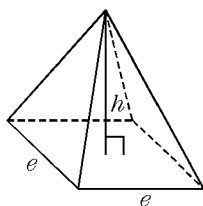


10. A cylindrical tank has a diameter of 80 feet and a height of 55 feet. To the nearest thousand gallons, how many gallons of oil are needed to fill the tank? (Note: $1 \text{ ft}^3 \approx 7.48 \text{ gal}$)

11. The volume of a cylinder is $200\pi \text{ cm}^3$ and the radius of its circular base is 6 cm. What is the height of this cylinder?

13. If the base area of a pyramid is kept the same while its height is multiplied by 3, the volume of the pyramid would be multiplied by a factor of ____.

15. In the diagram, a right square pyramid is shown. The altitude $h = 10$ and the base edge $e = 4$. What is the volume of the pyramid?



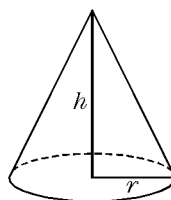
12. A cylindrical cake pan has a diameter of 10 inches and a height of 4 inches. If 220 cubic inches of cake batter is poured into the pan, how far up the sides of the pan will the batter come to the nearest tenth of an inch?

14. If the radius of the base of a cone is multiplied by 2 while the height is multiplied by 3, the volume of the cone will be multiplied by a factor of ____.

16. A right rectangular pyramid has a base area of 24 cm^2 and a volume of 128 cm^3 . What is the height of this pyramid?

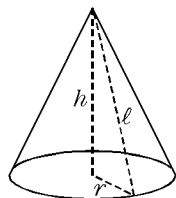
17. A triangular pyramid has a right triangle for a base with legs of 6 and 8. The height of the pyramid is 12. What is the volume of the pyramid?

18. In the diagram, the height h of the cone is 15 cm and the radius r of the base is 7 cm. What is the volume of the cone in cubic centimeters?

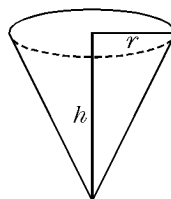


Honors Math 3
Volume Worksheet

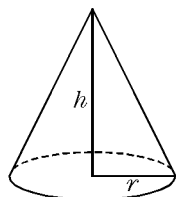
19. In the diagram, the height h of the cone is 12 cm and the slant height ℓ is 15 cm. What is the volume of the cone?



20. In the diagram, the height h of the cone is three times the radius of the cone. The volume of the cone is $343\pi \text{ cm}^3$. What is the height of the cone?



21. The volume of the cone shown is $24\pi \text{ cm}^3$ and the height h of the cone is 8 cm. What is the radius r of the cone?



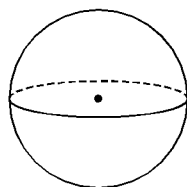
22. An ice cream cone manufacturer claims that their new cone can hold 33% more ice cream. The new cone has a diameter of 7 cm while the old cone had a diameter of 6 cm. The depth of the cones is the same. Is this claim true? Explain why or why not.

23. A paper drink cup has the shape of an inverted cone. Its height is 15 cm and its circular opening has a diameter of 8 cm. How many times would you need to fill this cup if you used it to drink a liter of water? (Note: $1 \text{ L} = 1000 \text{ cm}^3$)

24. An isosceles right triangle with legs of 9 m is spun using one of its legs as the axis of rotation. This forms a conic solid. What is the volume of this solid?

25. If the diameter of the sphere shown is 10, what is the exact volume of the sphere?

26. The sphere shown has a volume of $972\pi \text{ in}^3$. What is the radius of the sphere?



27. In the diagram, $r = \frac{1}{4}$. What is the volume of the hemisphere?

28. A scoop is in the shape of a hemisphere with a radius of 7 cm. A scoop of fine sand is poured into a cylinder with a diameter of 10 cm. To the nearest tenth of a centimeter, what is the height of the sand in the cylinder?

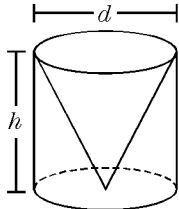


Honors Math 3
Volume Worksheet

29. The medical capsule shown is composed of two hemispheres and a cylinder. If the capsule has a length ℓ of 20mm and a width w of 6mm, what is the exact volume of medicine that the capsule contains? Assume that the thickness of the capsule is negligible.

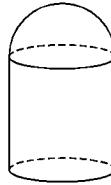


31. A right cylinder with a height h of 10 cm and a diameter d of 4 cm has a cone removed as shown in the diagram. Find the remaining volume.



33. A cone shaped ice cream cone has a depth of 5 inches and a width at the top of 3 inches. A spherical ball of soft ice cream with a diameter of 3 inches is placed in the cone. Is it possible to squish all of the ice cream into the cone without overflow? Justify your answer.
35. A rock is dropped into a cylindrical bucket that has a diameter of 10 inches. The water level rises 3 inches. What is the exact volume of the rock?

30. The silo shown is composed of a hemisphere and a cylinder. The total height of the silo is 50 feet and the diameter of the silo is 16 feet. What is the volume of the silo to the nearest cubic foot?



32. A sphere is inscribed in a cube. If the volume of the cube is 1000 cm^3 , what is the volume of the sphere?

1.
 Answer: nothing (no change)
 CodePath: EAS.GEO.K.D.16

2.
 Answer: 24 units³
 CodePath: EAS.GEO.K.D.21

3.
 Answer: 3360 units³
 CodePath: EAS.GEO.K.D.25

4.
 Answer: 2400
 CodePath: EAS.GEO.K.D.37

5.
 Answer: 9000 in³ ($5\frac{5}{24}$ ft³); 325 lbs
 CodePath: EAS.GEO.K.D.45

6.
 Answer: 6816 in³; $3\frac{17}{18}$ ft³; 0.15 yd³
 CodePath: EAS.GEO.K.D.48

7.
 Answer: 20π cm³
 CodePath: EAS.GEO.K.F.2

8.
 Answer: 280π in³
 CodePath: EAS.GEO.K.F.4

9.
 Answer: $\frac{8\pi}{25}$ m³
 CodePath: EAS.GEO.K.F.8

10.
 Answer: 2,068,000 gal
 CodePath: EAS.GEO.K.F.10

11.
 Answer: $\frac{50}{9}$ cm
 CodePath: EAS.GEO.K.F.17

12.
 Answer: 2.8 in.
 CodePath: EAS.GEO.K.F.20

13.
 Answer: 3
 CodePath: EAS.GEO.K.H.3

14.
 Answer: 12
 CodePath: EAS.GEO.K.H.7

15.
 Answer: $\frac{160}{3}$ units³
 CodePath: EAS.GEO.K.H.9

16.
 Answer: 16 cm
 CodePath: EAS.GEO.K.H.13

17.
 Answer: 96 units³
 CodePath: EAS.GEO.K.H.18

18.
 Answer: 245π cm³
 CodePath: EAS.GEO.K.H.21

19.
 Answer: 324π cm³
 CodePath: EAS.GEO.K.H.24

20.
 Answer: 21 cm
 CodePath: EAS.GEO.K.H.27

21.
 Answer: 3 cm
 CodePath: EAS.GEO.K.H.30

22.
 Answer: yes; it actually holds $\approx 36\%$ more
 CodePath: EAS.GEO.K.H.33

23.
 Answer: ≈ 4 times
 CodePath: EAS.GEO.K.H.38

24.
 Answer: 243π m³
 CodePath: EAS.GEO.K.H.40

25.
 Answer: $\frac{500\pi}{3}$ units³
 CodePath: EAS.GEO.K.J.3

26.
 Answer: 9 in.
 CodePath: EAS.GEO.K.J.5

27.
 Answer: $\frac{\pi}{96}$ units³
 CodePath: EAS.GEO.K.J.11

28.
Answer: 9.1 cm
CodePath: EAS.GEO.K.J.17
29.
Answer: $162\pi \text{ mm}^3$
CodePath: EAS.GEO.K.J.21
30.
Answer: 9517 ft^3
CodePath: EAS.GEO.K.J.23
31.
Answer: $\frac{80\pi}{3} \text{ cm}^3$
CodePath: EAS.GEO.K.M.7
32.
Answer: $\frac{500\pi}{3} \text{ cm}^3$
CodePath: EAS.GEO.K.M.9
33.
Answer: no; $V_{\text{cone}} \approx 11.8 \text{ in}^3$, $V_{\text{sphere}} \approx 14.1 \text{ in}^3$
CodePath: EAS.GEO.K.M.13
34.
Answer: 21.2 in^3
CodePath: EAS.GEO.K.M.15
35.
Answer: $75\pi \text{ in}^3$
CodePath: EAS.GEO.K.M.17