

Math 10

Lesson 6-8 Love those measurements, areas and volumes

I. Assignment

- Which imperial unit is the most appropriate unit to measure each item? Justify your choice.
 - the length of your arm
 - the width of the classroom
 - the distance you ran in gym class
- Convert:
 - 14 yd. to feet
 - 5 mi. to yards
 - 6 ft. 3 in. to inches
 - 123 in. to yards, feet, and inches
- The scale of a model airplane is 1 in. to 40 in. The model is 8 in. long. How long is the actual plane?
- Convert each measurement:
 - 261 cm to feet and the nearest inch
 - 125 m to yards, feet, and the nearest inch
 - 6 km to miles and the nearest yard
 - 350 mm to feet and the nearest inch
- Convert each measurement. Answer to the nearest tenth.
 - 13 yd. 2 ft. to metres
 - 4 mi. 350 yd. to kilometres
 - 1 ft. 7 in. to centimetres
 - 8 in. to millimetres

- The length of Vancouver Island from the north to the south is approximately 460 km. Sarah has an average stride length of 27 in. How many strides would Sarah take to walk from the northernmost tip to the southernmost tip?

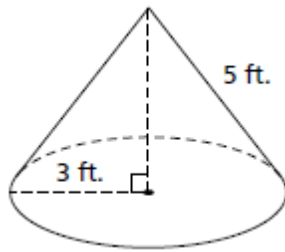


- A right rectangular pyramid has base dimensions 7 yd. by 5 yd. and a height of 10 yd. Determine the surface area of the pyramid to the nearest square yard.

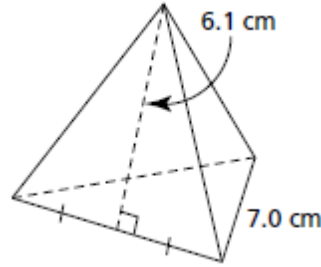


8. Determine the surface area of each object to the nearest square unit.

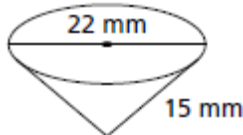
a) right cone



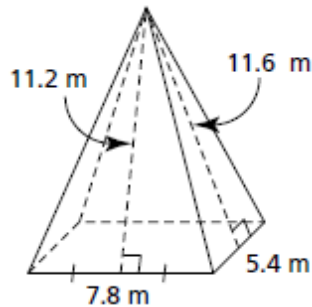
b) regular tetrahedron



c) right cone



d) right rectangular pyramid



9. Julie is constructing a tent in the shape of a right square pyramid. She uses 4 poles, each 2.1 m long, for the edges that form the triangular surfaces. The side length of the base of the tent is 1.5 m.

a) Sketch a diagram of the tent.

b) What is the slant height of the tent to the nearest tenth of a metre?

c) What is the lateral surface area of the tent to the nearest square metre?

10. A regular tetrahedron has edge length 10 in.

a) What is the slant height of the tetrahedron to the nearest tenth of an inch?

b) What is the surface area of the tetrahedron to the nearest square inch?

11. An ice-cream cone is to be coated with chocolate on the inside. The cone has an interior diameter of 7.5 cm and an interior height of 10.0 cm. What is the area to be coated? Write the answer to the nearest tenth of a square unit.

12. The Summerhill Pyramid Winery in Kelowna, B.C., has a pyramid that is a replica of the Great Pyramid in Egypt. The Summerhill pyramid has base side length 60 ft. and height 38 ft. The pyramid is to be coated with polished white limestone. What area of limestone is needed to the nearest square foot?

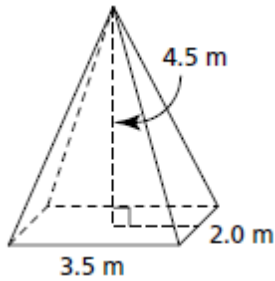
13. To determine the volume of a cone, Owen measured its slant height as 7.3 cm and its base diameter as 9.6 cm. Can Owen determine the volume of the cone with only these measurements? If your answer is yes, show your solution. If your answer is no, explain what Owen needs to do to determine the volume, then calculate the volume.

14. Emma used water displacement in a large measuring cylinder to determine that the volume of a right square pyramid was 400 cm^3 . Emma measured the side of the base as 10 cm. What was the height of the pyramid?

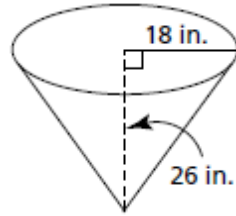


15. Determine the volume of each object to the nearest cubic unit.

a) right rectangular pyramid



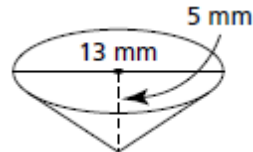
b) right cone



c) right square pyramid



d) right cone pyramid

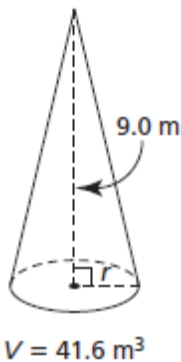


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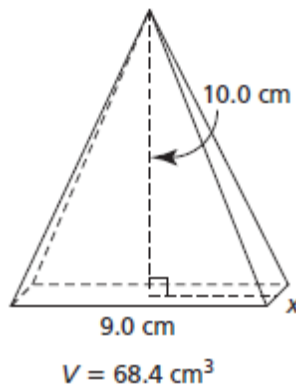
- A solid iron garden ornament has the shape of a right square pyramid. The slant height of the pyramid is 8 in. and the side length of the base is 3 in. Determine the volume of the garden ornament to the nearest cubic inch.
- Another garden ornament has volume 96 cubic inches. It has the same shape and the same height as the ornament in part a. What is the side length of its base to the nearest inch?

17. For each object, its volume, V , and some dimensions are given. Calculate the dimension indicated by the variable. Write each answer to the nearest tenth of a unit.

a) right cone



b) right rectangular pyramid



18. Determine the surface area and volume of each sphere. Write the answers to the nearest whole unit.

a) $4\frac{1}{2}$ in.



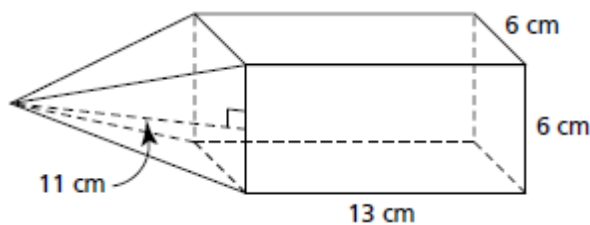
b)



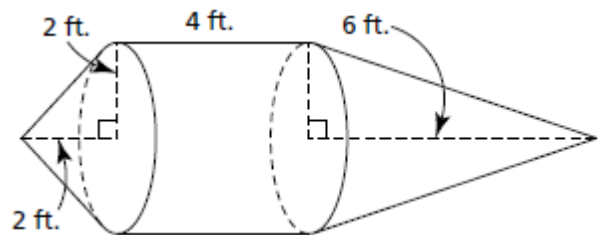
19. Sketch a hemisphere with diameter 18 ft.
- What is the surface area of the hemisphere to the nearest square foot?
 - What is the volume of the hemisphere to the nearest cubic foot?
20. The surface area of a sphere is approximately 66 square inches. What is the diameter of the sphere to the nearest tenth of an inch?
21. A handful of snow is compressed into a spherical snowball. The snowball has circumference 18 cm. What is its volume?
22. A “gazing ball” is a spherical garden ornament with a mirrored surface that reflects its surroundings. The surface area of the ball is approximately 314 square inches. What is its volume to the nearest cubic inch?

23. Determine the surface area and volume of each composite object to the nearest whole unit.

a) right square prism and right square pyramid



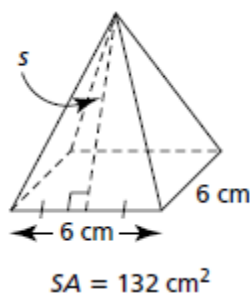
b) right cylinder and right cones



24. A sandcastle comprises a right rectangular prism with base dimensions 75 cm by 50 cm, and height 30 cm. There are 4 congruent cones on the top surface of the prism. Each cone has base diameter 10 cm and slant height 15 cm.
- Determine the volume of sand required to construct this castle. Write the answer to the nearest cubic centimetre.
 - Determine the surface area of the castle. Write the answer to the nearest square centimetre.

25. For each object, its surface area, SA , and some dimensions are given. Calculate the dimension indicated by the variable. Write each answer to the nearest whole unit.

a) right square pyramid



b) right cone

