

Geometry - Geometric Modeling Applications - Worksheet

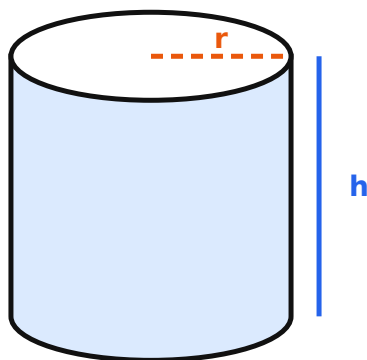
Common Core G-MG.A.1, G-MG.A.2, G-MG.A.3 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice modeling with shapes, density and design problems (Common Core G-MG.A.1 to G-MG.A.3). The first problems are quick one-step checks of the definitions and formulas from the lesson. The middle problems ask for diagrams, equations and careful reasoning in the style of a high school Geometry class. The last six problems are applications with cans, fences, tanks, concrete and honeycombs.

Geometry · Common Core State Standards: **G-MG.A.1, G-MG.A.2, G-MG.A.3**

Exercise 1 - Can as a cylinder



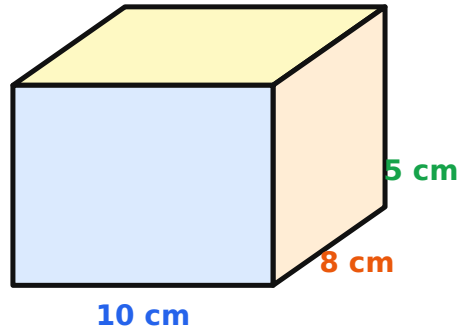
A soup can is modeled by a cylinder.

A soup can has diameter 6.6 cm and height 11.5 cm. Model it as a cylinder and find its volume to the nearest tenth.

Exercise 2 - A log

A log is modeled as a cylinder with diameter 24 inches and length 20 feet. Find its volume in cubic feet to the nearest tenth. (Convert first.)

Exercise 3 - Density of aluminum



Aluminum block.

An aluminum block is 10 cm by 8 cm by 5 cm and has mass 1,080 g. Find its density.

Exercise 4 - Mass of a lead cylinder

A lead cylinder has radius 2 cm and height 10 cm. Lead has density 11.34 g per cm^3 . Find the mass to the nearest gram.

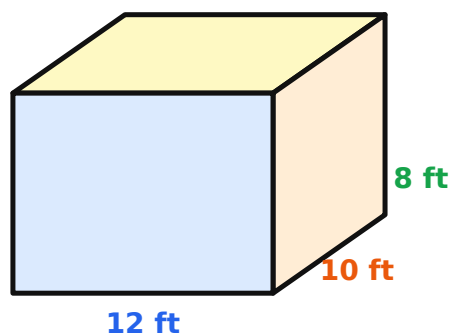
Exercise 5 - Population density

Maple Falls has 31,250 people on 12.5 square miles. Find its population density.

Exercise 6 - Population from density

A suburb has a population density of 4,200 people per square mile and covers 6.5 square miles. Estimate its population.

Exercise 7 - Painting a room



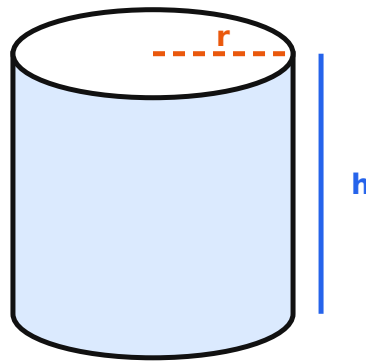
Room 12 ft by 10 ft with 8 ft walls.

Jamal paints the four walls of a room 12 ft by 10 ft with 8-ft walls, ignoring doors and windows. One gallon covers 350 square feet and costs \$32. Find the wall area, the gallons needed (round up to a whole number) and the cost of one coat.

Exercise 8 - Weight of a beam

A pine beam is 4 inches by 6 inches by 12 feet. Pine weighs 35 pounds per cubic foot. Find the volume in cubic feet and the weight of the beam.

Exercise 9 - Gallons in a tank



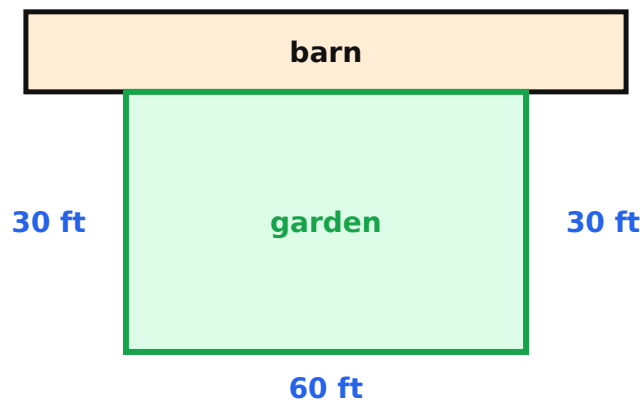
A soup can is modeled by a cylinder.

A cylindrical tank has radius 4 feet and height 10 feet. One cubic foot holds about 7.48 gallons. How many gallons does the tank hold, to the nearest 10 gallons?

Exercise 10 - Concrete slab

A patio slab is 20 ft by 12 ft and 4 inches thick. Concrete costs \$145 per cubic yard. Find the volume in cubic yards (to the nearest hundredth) and the cost to the nearest dollar.

Exercise 11 - Fence design



Fence on three sides of a rectangular garden next to a barn.

Maya has 120 feet of fence to enclose three sides of a rectangular garden next to a barn. She compares widths of 25, 30 and 35 feet. Find the length and area of each design and choose the largest area.

Exercise 12 - Minimum height of a tank

A cylindrical tank with radius 5 feet must hold at least 1,000 cubic feet. Find the smallest height to the nearest tenth of a foot.

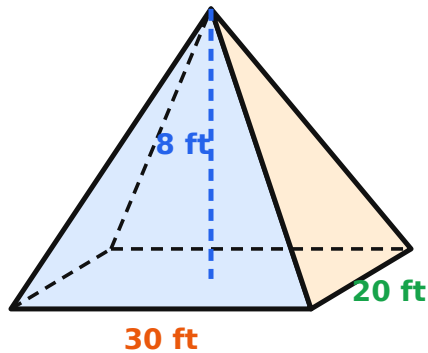
Exercise 13 - Material for a can

A can has radius 3.3 cm and height 11.5 cm. Find the surface area of the metal to the nearest square centimeter.

Exercise 14 - Painting a tank

The curved side of a cylindrical tank (radius 4 ft, height 10 ft) is painted. Paint covers 250 square feet per gallon. Find the area and the gallons to buy (round up).

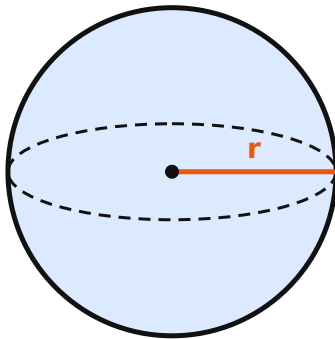
Exercise 15 - Attic volume



Attic as a pyramid.

A roof forms a pyramid with a 30 ft by 20 ft rectangular base and height 8 ft. Find the volume of air in the attic.

Exercise 16 - Basketball



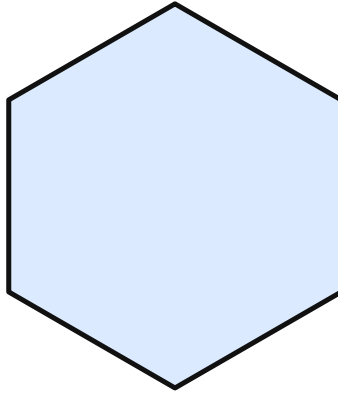
A ball is modeled by a sphere.

A basketball has diameter 9.5 inches. Model it as a sphere and find its volume to the nearest tenth.

Exercise 17 - Grass seed

A 60 ft by 90 ft lot has a 40 ft by 30 ft house on it. Grass seed is used at 1 pound per 400 square feet on the part without the house. How many pounds are needed?

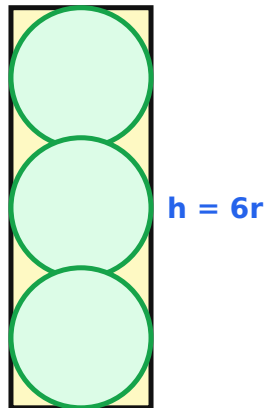
Exercise 18 - Honeycomb cell



A honeycomb cell is modeled by a regular hexagon.

A honeycomb cell is a regular hexagon with side 3 mm. Find its area to the nearest tenth, using $A = \frac{3\sqrt{3}}{2}s^2$.

Exercise 19 - Tennis ball can



radius r
Can holding three balls.

A tennis ball can is a cylinder of height $6r$ that holds three balls of radius r . Find the fraction of the can's volume that is empty.

Exercise 20 - Best pizza value

A 10-inch pizza costs \$8 and a 14-inch pizza costs \$14 (diameters). Compare the area per dollar and decide which is the better value.