

Geometry · Area and Volume Formulas · Worksheet

Common Core G-GMD.A.1, G-GMD.A.3 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

These worksheets practice standards G-GMD.A.1 and G-GMD.A.3: circumference and area of a circle, the dissection and Cavalieri arguments behind the formulas, and volumes of cylinders, pyramids, cones and spheres.

The 23 problems move from circles to solids, then to word problems with tanks, candles and ice cream. Leave answers in terms of π or round as directed.

Geometry Common Core: G-GMD.A.1 · G-GMD.A.3

Problem 1: Circumference from the radius

A circular fountain has a radius of 7 cm in a scale model. Find its circumference in terms of π and to the nearest hundredth.

Problem 2: Circumference from the diameter

A round trampoline has a diameter of 18 in on a toy set. Find its circumference in terms of π and to the nearest hundredth.

Problem 3: Radius from the circumference

A circular garden path has a circumference of 25.12 m. Use $\pi \approx 3.14$ to find its radius.

Problem 4: Area of a circle

A circular pizza pan has a radius of 9 ft on a giant food truck sign. Find its area in terms of π and to the nearest hundredth.

Problem 5: Area from the diameter

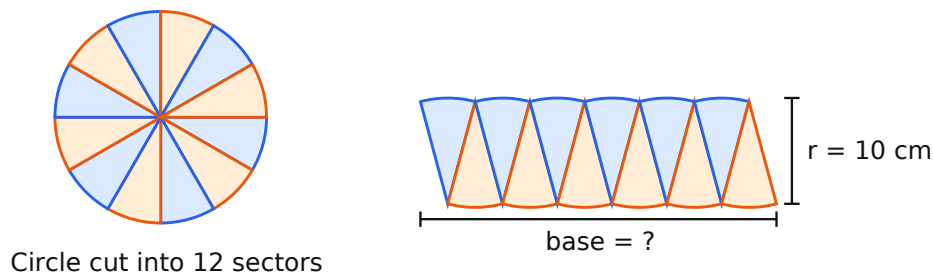
A circular coaster has a diameter of 14 in. Find its area in terms of π and to the nearest hundredth.

Problem 6: Radius from the area

A circle has an area of $144\pi \text{ cm}^2$. Find its radius and its circumference in terms of π .

Problem 7: Sectors into a parallelogram

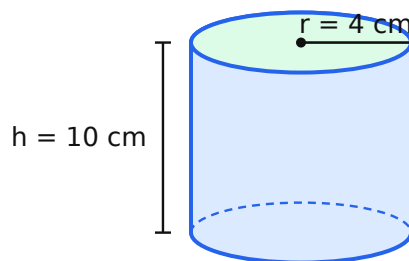
A circle with radius 10 cm is cut into 12 sectors that are rearranged as shown. Find (a) the circumference of the circle, (b) the base of the rearranged shape, and (c) its area, using base times height.



Sectors of a circle with radius 10 cm.

Problem 8: Volume of a cylinder

Find the volume of the cylinder, in terms of π and to the nearest hundredth.



A cylinder, $r = 4 \text{ cm}$.

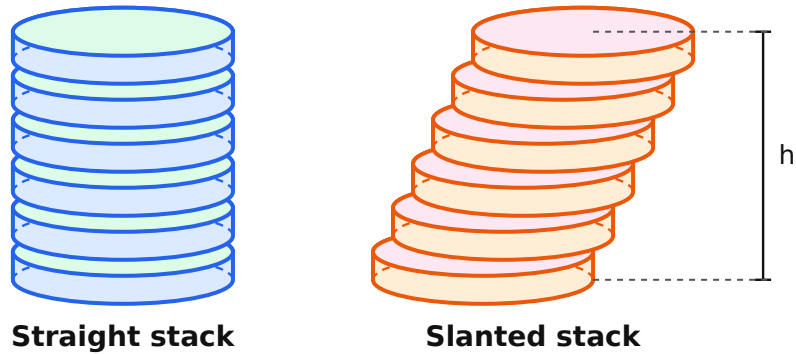
Problem 9: Height of a cylinder

A cylindrical can has a volume of $225\pi \text{ in}^3$ and a radius of 5 in. Find its height.

Problem 10: Equal stacks of coins

Priya builds two stacks of 6 identical coins. One stack is straight and the other leans. Each coin has a face area of 5 cm^2 and a thickness of 0.3 cm. (a) Find the height of each stack. (b) Find

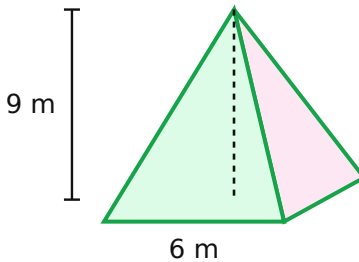
the volume of each stack. (c) Explain why the leaning stack has the same volume.



Two stacks of 6 coins.

Problem 11: Volume of a pyramid

Find the volume of the square pyramid.



A square pyramid, base 6 m.

Problem 12: Rectangular pyramid

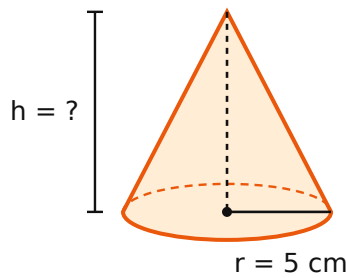
A pyramid-shaped tent has a rectangular base of 8 ft by 5 ft and a height of 12 ft. Find its volume.

Problem 13: Volume of a cone

A cone has a radius of 3 in and a height of 7 in. Find its volume in terms of π and to the nearest hundredth.

Problem 14: Height of a cone

The cone has a radius of 5 cm and a volume of $100\pi \text{ cm}^3$. Find its height.



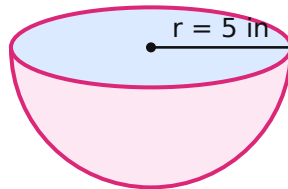
A cone, $V = 100\pi \text{ cm}^3$.

Problem 15: Volume of a sphere

A rubber ball has a radius of 6 cm . Find its volume in terms of π and to the nearest hundredth.

Problem 16: Volume of a hemisphere

A bowl is a hemisphere with radius 5 in . Find the volume it holds in terms of π and to the nearest hundredth.



A hemisphere bowl.

Problem 17: Cone compared with cylinder

A cone and a cylinder each have a radius of 4 cm and a height of 9 cm . Find both volumes in terms of π , then write the volume of the cone as a fraction of the volume of the cylinder.

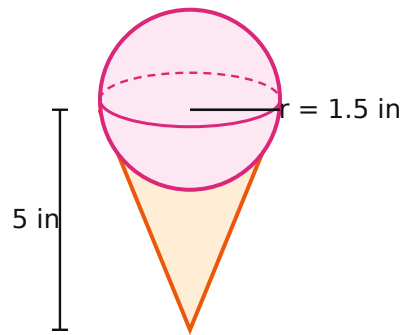
Problem 18: Grain bin

A farm has a cylindrical grain bin with a radius of 6 ft and a height of 20 ft . (a) Find its volume to the nearest hundredth. (b) A truck carries 50 ft^3 per load. How many loads empty a full bin?

Problem 19: Scoop on a sugar cone

Jamal puts one spherical scoop of ice cream with radius 1.5 in on a cone with radius 1.5 in and height 5 in . If the ice cream melts into the cone, does it overflow? Find the difference in

volume to the nearest hundredth.



A sugar cone with a scoop.

Problem 20: Depth of water in a tank

A cylindrical tank has a diameter of 10 ft and holds $1,000 \text{ ft}^3$ of water when it is full. Find the depth of the water to the nearest hundredth of a foot.

Problem 21: Melting candles

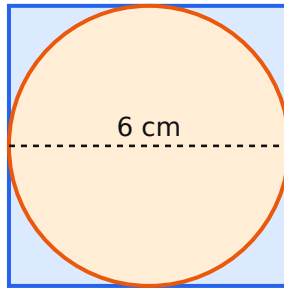
Maya melts 4 square-pyramid candles, each with a base side of 3 in and a height of 5 in, and pours all the wax into a cylindrical mold with a radius of 2 in. How tall is the wax in the mold? Round to the nearest hundredth.

Problem 22: Cone cup poured into a cylinder

A paper cup shaped like a cone has a radius of 4 cm and a height of 12 cm. It is filled with water and poured into an empty cylinder with a radius of 4 cm. How deep is the water in the cylinder?

Problem 23: Ball in a box

Aisha packs a ball with a diameter of 6 cm in a cube-shaped box with an edge of 6 cm. (a) What percent of the box is filled by the ball, to the nearest tenth of a percent? (b) Find the volume of empty space to the nearest hundredth.



Front view: the ball touches all four sides.