

Cross Sections, Rotations and Geometric Modeling

Grade 10 – Geometry math · Test · Standards: G-GMD.B.4, G-MG.A.1, G-MG.A.2, G-MG.A.3

Name: _____ Date: _____ Class: _____

This test has 8 questions worth 20 points and is designed for 45 minutes. A calculator is allowed. State the shape you use to model each object and include units in every answer.

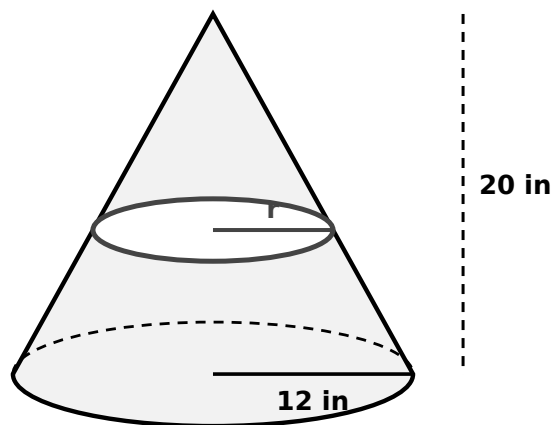
Standards: G-GMD.B.4, G-MG.A.1, G-MG.A.2, G-MG.A.3 · **Level:** Grade 10 Geometry

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Name the Cross Sections (2 points)

Name the cross section: (a) a plane parallel to the base of a cone (*1 point*); (b) a plane through the axis of a cylinder (*1 point*).

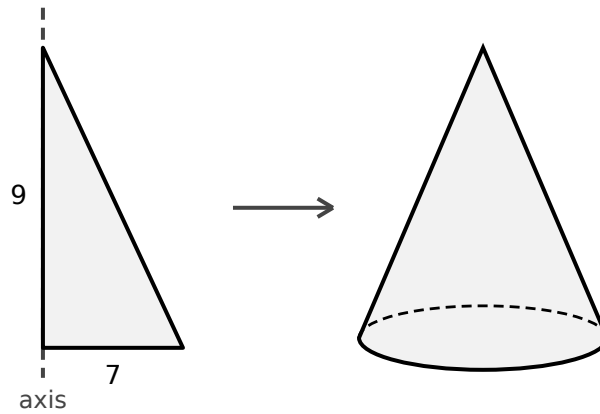
Question 2 Slice of a Cone (2 points)



Plane 12 in from the apex.

Find the radius (*1 point*) and area (*1 point*) of the cross section.

Question 3 Rotated Triangle (2 points)



Not drawn to scale.

The triangle is rotated about the leg of length 9. Name the solid (1 point) and find its volume to the nearest tenth (1 point).

Question 4 Compare Densities (3 points)

County A has 28,350 residents on 63 square miles. County B has 120,900 residents on 190 square miles. Find each density to the nearest tenth and state which county is more crowded.

Question 5 Furnace Choice (3 points)

A room is 20 feet by 15 feet with a ceiling 9 feet high. It needs 24 BTUs per cubic foot. Furnace A delivers 60,000 BTUs and furnace B delivers 75,000 BTUs. Find the BTUs needed and decide which furnaces are large enough.

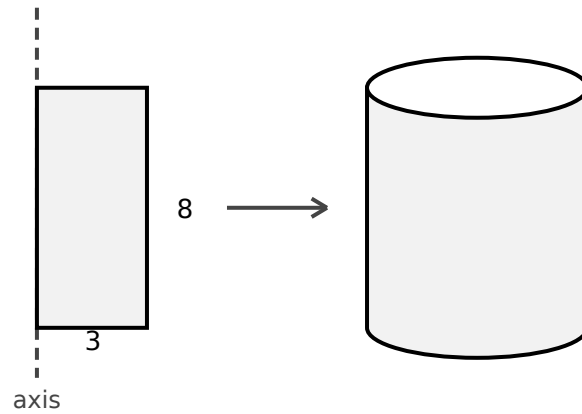
Question 6 Design a Container (3 points)

A cylindrical container must hold exactly 1 liter (1,000 cubic centimeters) and have radius 5 centimeters. Find its height to the nearest tenth of a centimeter and decide whether it fits on a shelf 12 centimeters tall.

Question 7 Grain Bin (3 points)

A grain bin is modeled as a cylinder with radius 8 feet and height 20 feet. One bushel is about 1.244 cubic feet. How many bushels can it hold, to the nearest bushel?

Question 8 Rotate the Shape (2 points)



Not drawn to scale.

Name the solid formed when (a) a rectangle is rotated about one of its sides (*1 point*); (b) a half disk is rotated about its diameter (*1 point*).