

Geometry - Area, Volume and Dissection Arguments - Test Answer Key

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

Use this answer key and scoring guide for the volume formulas test. Each solution shows the full work, and the scoring note tells how the points are split between method and final answer. Partial credit is listed so that grading stays consistent from one paper to the next.

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

Question 1 - Circle [2 pts]

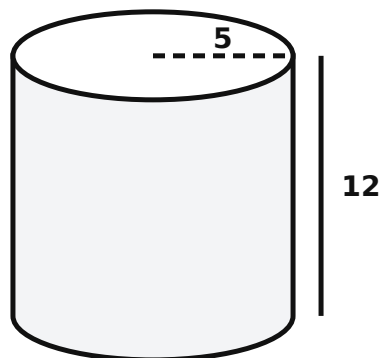
$$2\pi r = 18\pi, \text{ so } r = 9.$$

$$A = \pi \cdot 81 = 81\pi$$

$r = 9$; area 81π

Scoring: 1 point for the radius, 1 point for the area.

Question 2 - Cylinder [2 pts]



$$V = 300\pi.$$

$$V = \pi \cdot 5^2 \cdot 12 = 300\pi = 942.5$$

942.5 cubic units

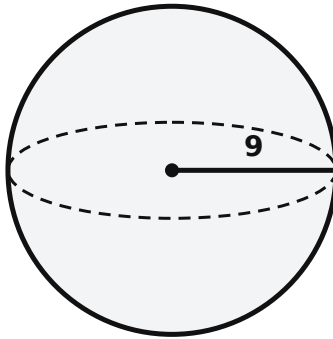
Scoring: 1 point for the formula, 1 point for the answer.

Question 3 - Cone [2 pts]

$$V = \frac{1}{3}\pi \cdot 9^2 \cdot 12 = 324\pi$$

324 π

Scoring: 1 point for the formula, 1 point for the answer.

Question 4 - Sphere [2 pts]

$$V = 972\pi.$$

Radius 9.

$$V = \frac{4}{3}\pi \cdot 9^3 = 972\pi$$

972 π

Scoring: 1 point for the radius, 1 point for the volume.

Question 5 - Pyramid [2 pts]

$$V = \frac{1}{3} \cdot 144 \cdot 10 = 480$$

480 cubic units

Scoring: 1 point for the base area, 1 point for the volume.

Question 6 - Cavalieri [2 pts]

Cylinder: $\pi \cdot 4^2 \cdot 7 = 112\pi$.

Cavalieri's principle: the other solid has the same volume, 112π .

112π each

Scoring: 1 point for the volume, 1 point for the principle.

Question 7 - Missing dimension [2 pts]

$$\frac{1}{3}\pi \cdot 36 \cdot h = 48\pi$$

$$12h = 48, \text{ so } h = 4.$$

h = 4

Scoring: 1 point for the equation, 1 point for h.

Question 8 - Dissection [3 pts]

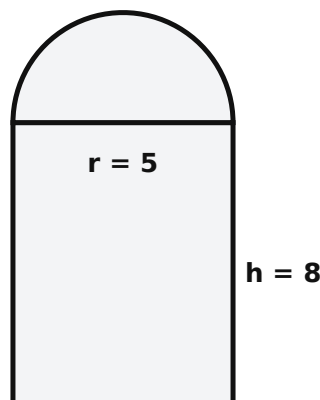
a. $\frac{1}{3} \cdot 16 \cdot 4 = \frac{64}{3}$

b. Three, since $64 \div \frac{64}{3} = 3$.

c. Three equal pyramids fill the prism with the same base and height, so each is one third of Bh.

Scoring: 1 point per part.

Question 9 - Composite solid [3 pts]



Total volume $850\pi/3$, about 890.1.

Cylinder: $\pi \cdot 25 \cdot 8 = 200\pi$.

Hemisphere: $\frac{2}{3}\pi \cdot 125 = \frac{250}{3}\pi$.

$$200\pi + \frac{250}{3}\pi = \frac{850}{3}\pi = 890.1$$

890.1 cubic units

Scoring: 1 point for each solid, 1 point for the total.

Total
20 points