Area & Volume

CollegeBoard Question Bank

Abstract

This exercise sheet contains

- an **Easy** category with 5 questions;
- a **Medium** category with 8 questions;
- a **Hard** category with 8 questions

for you to attempt. A digital copy of this sheet is available for you on moodle. Feel free to utilize the **Question Space** on Teams to ask for guidance.

Best,
Omar :)

Area & Volume

Easy

(1) **0837c3b9** MULTIPLE CHOICE One answer only

Triangle ABC and triangle DEF are similar triangles, where $\overline{AB}$ and $\overline{DE}$ are corresponding sides. If $DE = 2AB$ and the perimeter of triangle ABC is 20 , what is the perimeter of triangle DEF?

a. 80
b. 40
c. 120
d. 10

(2) **c88183f7** MULTIPLE CHOICE One answer only

A rectangle has a length of 13 and a width of 6 . What is the perimeter of the rectangle?

a. 38
b. 12
c. 52
d. 26

(3) **f60bb551** MULTIPLE CHOICE One answer only

The area of a rectangle is 630 square inches. The length of the rectangle is 70 inches. What is the width, in inches, of this rectangle?

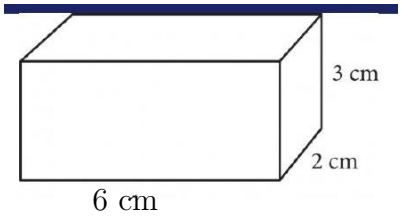
a. 315
b. 9
c. 70
d. 560

(4) **4420e500** MULTIPLE CHOICE One answer only

What is the area of a rectangle with a length of 4 centimeters (cm) and a width of 2 cm ?

a. 12 cm^2
b. 36 cm^2
c. 6 cm^2
d. 8 cm^2

(5) **d683a9cc** MULTIPLE CHOICE One answer only



The figure shows the lengths, in centimeters (cm), of the edges of a right rectangular prism. The volume V of a right rectangular prism is ℓw, where ℓ is the length of the prism, w is the width of the prism, and h is the height of the prism. What is the volume, in cubic centimeters, of the prism?

a. 12
b. 36
c. 24
d. 11

Medium

(1) **f67e4efc** MULTIPLE CHOICE One answer only

A right circular cylinder has a volume of 45π. If the height of the cylinder is 5 , what is the radius of the cylinder?

a. 40
b. 9
c. 3
d. 4.5

(2) **5afbdc8e** MULTIPLE CHOICE One answer only

What is the length of one side of a square that has the same area as a circle with radius 2 ?

a. 2π
b. $2\sqrt{\pi}$
c. $\sqrt{2\pi}$
d. 2

(3) **ec5d4823** SHORT ANSWER Case-Insensitive

What is the volume, in cubic centimeters, of a right rectangular prism that has a length of 4 centimeters, a width of 9 centimeters, and a height of 10 centimeters?

(4) **151eda3c** MULTIPLE CHOICE One answer only

A manufacturing company produces two sizes of cylindrical containers that each have a height of 50 centimeters. The radius of container A is 16 centimeters, and the radius of container B is 25% longer than the radius of container A . What is the volume, in cubic centimeters, of container B ?

a. $20,000\pi$
b. $25,000\pi$
c. $16,000\pi$
d. $31,250\pi$

(5) **38517165** SHORT ANSWER Case-Insensitive

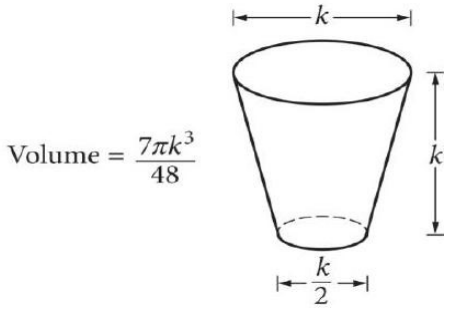
A circle has a circumference of 31π centimeters. What is the diameter, in centimeters, of the circle?

(6) **a2e76b60** MULTIPLE CHOICE One answer only

A cylindrical can containing pieces of fruit is filled to the top with syrup before being sealed. The base of the can has an area of 75 cm^2, and the height of the can is 10 cm . If 110 cm^3 of syrup is needed to fill the can to the top, which of the following is closest to the total volume of the pieces of fruit in the can?

a. 750 cm^3
b. 640 cm^3
c. 7.5 cm^3
d. 185 cm^3

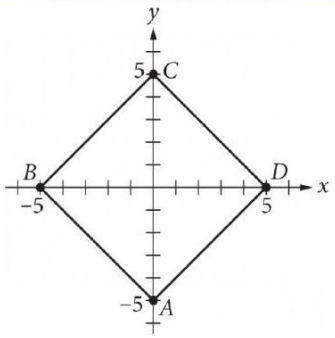
(7) **37dde49f** MULTIPLE CHOICE One answer only



The glass pictured above can hold a maximum volume of 473 cubic centimeters, which is approximately 16 fluid ounces. What is the value of k, in centimeters?

a. 2.52
b. 10.11
c. 7.79
d. 7.67

(8) **cf53cb56** MULTIPLE CHOICE One answer only



In the xy-plane shown, square $ABCD$ has its diagonals on the x - and y-axes. What is the area, in square units, of the square?

a. 20
b. 50
c. 25
d. 100

Hard

(1) **b0dc920d** MULTIPLE CHOICE One answer only

A manufacturer determined that right cylindrical containers with a height that is 4 inches longer than the radius offer the optimal number of containers to be displayed on a shelf. Which of the following expresses the volume, V , in cubic inches, of such containers, where r is the radius, in inches?

a. $V = \pi(2r)^3$
b. $V = 4\pi r^3$
c. $V = \pi r^2 + 4\pi r$
d. $V = \pi r^3 + 4\pi r^2$

(2) **5b2b8866** SHORT ANSWER Case-Insensitive

A rectangular poster has an area of 360 square inches. A copy of the poster is made in which the length and width of the original poster are each increased by 20%. What is the area of the copy, in square inches?

(3) **dc71597b** MULTIPLE CHOICE One answer only

A right circular cone has a volume of $\frac{1}{3}\pi$ cubic feet and a height of 9 feet. What is the radius, in feet, of the base of the cone?

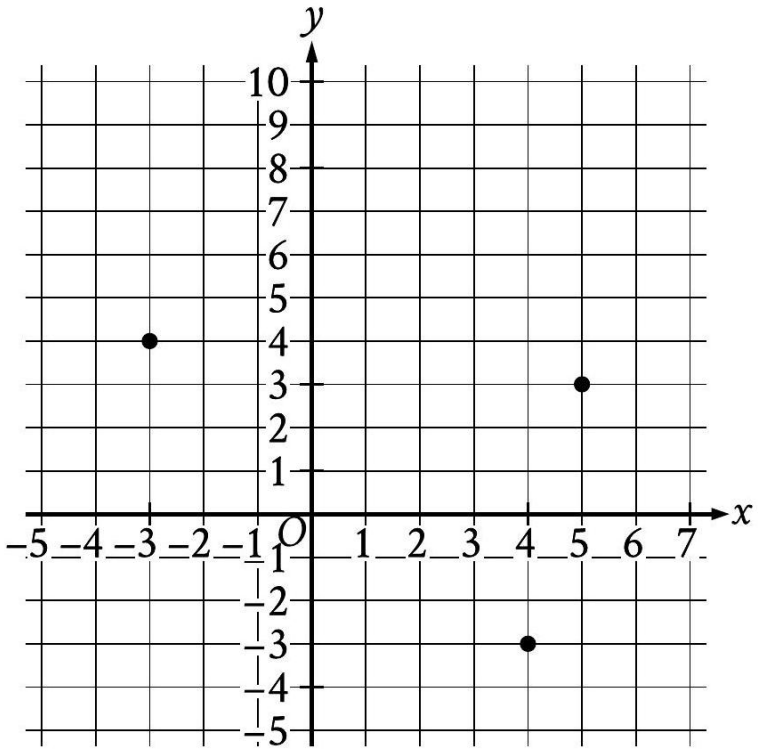
a. 3
b. $\frac{1}{3}$
c. $\frac{1}{\sqrt{3}}$
d. $\sqrt{3}$

(4) **93de3f84** MULTIPLE CHOICE One answer only

The volume of right circular cylinder A is 22 cubic centimeters. What is the volume, in cubic centimeters, of a right circular cylinder with twice the radius and half the height of cylinder A ?

a. 22
b. 44
c. 66
d. 11

(5) **eb70d2d0** SHORT ANSWER Case-Insensitive



What is the area, in square units, of the triangle formed by connecting the three points shown?

(6) **f7e626b2** MULTIPLE CHOICE One answer only

The dimensions of a right rectangular prism are 4 inches by 5 inches by 6 inches. What is the surface area, in square inches, of the prism?

a. 30
b. 148
c. 74
d. 120

(7) **310c87fe** MULTIPLE CHOICE One answer only

A cube has a surface area of 54 square meters. What is the volume, in cubic meters, of the cube?

a. 27
b. 18
c. 81
d. 36

(8) **459dd6c5** SHORT ANSWER Case-Insensitive

Triangles ABC and DEF are similar. Each side length of triangle ABC is 4 times the corresponding side length of triangle DEF. The area of triangle ABC is 270 square inches. What is the area, in square inches, of triangle DEF ?

Total of marks: 21