

SAT Area and Volume Worksheet

Name: _____ Date: _____

Circle one answer for each question. Use the blank space for calculations. A calculator is allowed.

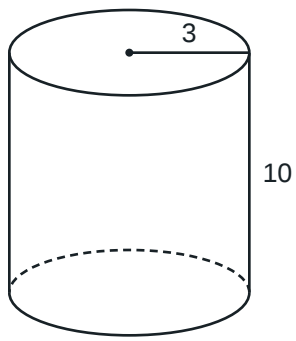
- 1. A rectangular prism has length 8 centimeters, width 3 centimeters, and height 5 centimeters. What is its volume, in cubic centimeters?**

A. 16
B. 79
C. 120
D. 158

- 2. A square has a perimeter of 36 feet. What is its area, in square feet?**

A. 36
B. 81
C. 144
D. 324

3.



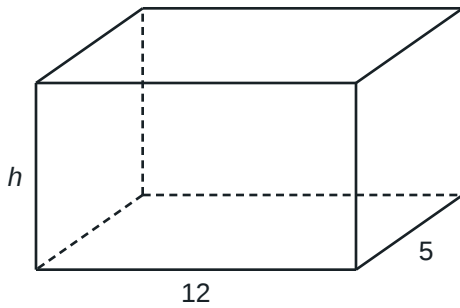
The right circular cylinder shown has radius 3 and height 10. What is its volume?

- A. 60π
- B. 90π
- C. 300π
- D. 360π

4. A cube has a volume of 64 cubic inches. What is its surface area, in square inches?

- A. 24
- B. 64
- C. 96
- D. 384

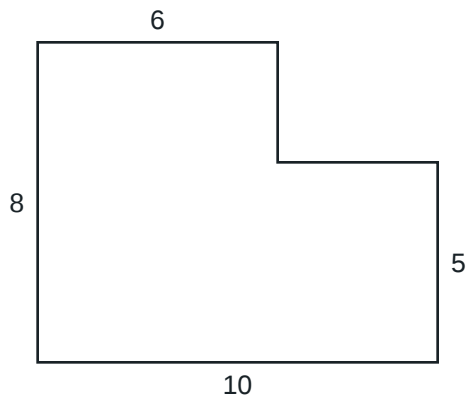
5.



The rectangular box shown has a volume of 360 cubic inches. The dimensions are in inches. What is the value of h ?

- A. 6
- B. 12
- C. 30
- D. 72

6.



The figure shows the floor plan of a room. All corners are right angles, and the lengths are in meters. What is the area of the floor, in square meters?

- A. 48
- B. 56
- C. 60
- D. 68

7. A rectangular patio measures 6 yards by 4 yards. What is its area, in square feet?
(1 yard = 3 feet)
- A. 24
 - B. 72
 - C. 144
 - D. 216
8. A right circular cone has radius 6 centimeters and height 5 centimeters. What is its volume, in cubic centimeters?
- A. 10π
 - B. 30π
 - C. 60π
 - D. 180π
9. Rectangle B is similar to rectangle A, and each side of rectangle B is 3 times as long as the corresponding side of rectangle A. The area of rectangle A is 12 square units. What is the area of rectangle B, in square units?
- A. 36
 - B. 48
 - C. 72
 - D. 108

10. A sphere has a volume of 36π cubic centimeters. What is the radius of the sphere, in centimeters?
- A. 3
 - B. 6
 - C. 9
 - D. 27
11. Cylinder A has radius r and height h . Cylinder B has radius $2r$ and height $\frac{h}{2}$. The volume of cylinder B is how many times the volume of cylinder A?
- A. 1
 - B. 2
 - C. 4
 - D. 8
12. A rectangular tank has a base 50 centimeters long and 40 centimeters wide and is partly filled with water. A solid cube with 10-centimeter edges is placed in the tank, where it sinks and is completely covered by the water. No water spills. By how many centimeters does the water level rise?
- A. 0.5
 - B. 1
 - C. 2
 - D. 10

Answer key

1 C · 2 B · 3 B · 4 C · 5 A · 6 D · 7 D · 8 C · 9 D · 10 A · 11 B · 12 A

1. C: 120

The volume of a rectangular prism is length times width times height: $8(3)(5) = 120$. Choice D, 158, is the surface area.

2. B: 81

Each side is $\frac{36}{4} = 9$ feet, so the area is $9^2 = 81$ square feet. Choice A is the perimeter.

3. B: 90π

Volume is $\pi r^2 h = \pi(3^2)(10) = 90\pi$. Choice C uses 10 as the radius and 3 as the height.

4. C: 96

The edge length is 4 inches because $4^3 = 64$. Each of the 6 faces has area 16 square inches, so the surface area is $6(16) = 96$ square inches. Choice D multiplies the volume by 6.

5. A: 6

Volume is length times width times height, so $12(5)h = 360$. Then $60h = 360$ and $h = 6$. Choice C divides 360 by 12 only.

6. D: 68

Split the floor into a 10-by-5 rectangle and a 6-by-3 rectangle above it: $50 + 18 = 68$ square meters. As a check, the missing corner is 4 by 3, and $10(8) - 4(3) = 68$.

7. D: 216

Convert first: the patio is 18 feet by 12 feet, so its area is $18(12) = 216$ square feet. Choice B multiplies 24 square yards by 3, but 1 square yard is 9 square feet.

8. C: 60π

The volume of a cone is $\frac{1}{3}\pi r^2 h = \frac{1}{3}\pi(36)(5) = 60\pi$. Choice D leaves out the $\frac{1}{3}$.

9. D: 108

Multiplying every length by 3 multiplies the area by $3^2 = 9$. The area of rectangle B is $9(12) = 108$ square units. Choice A multiplies the area by 3 instead of 9.

10. A: 3

Set $\frac{4}{3}\pi r^3 = 36\pi$. Then $r^3 = 36(\frac{3}{4}) = 27$, so $r = 3$. Choice D is r^3 , not r .

11. B: 2

The volume of cylinder B is $\pi(2r)^2(\frac{h}{2}) = \pi(4r^2)(\frac{h}{2}) = 2\pi r^2 h$, which is 2 times the volume of cylinder A. Doubling the radius multiplies the volume by 4, and halving the height divides it by 2.

12. A: 0.5

The cube pushes aside $10^3 = 1,000$ cubic centimeters of water, which spreads over the base area of $50(40) = 2,000$ square centimeters. Dividing 1,000 by 2,000 gives a rise of 0.5 centimeter. Choice C divides the base area by the volume instead.