



Practice

7.1 Surface Area and Volume

Determine the surface-area-to-volume ratio for a rectangular prism with the indicated dimensions. Show all of your steps.

1. $4 \times 4 \times 3$

$$S = 2(4 \times 4) + 2(4 \times 3) + 2(4 \times 3);$$

$$V = 4 \times 4 \times 3; \frac{5}{3} \approx 1.67$$

2. $80 \times 1 \times 1$

$$S = 2(80 \times 1) + 2(80 \times 1) + 2(1 \times 1);$$

$$V = 80 \times 1 \times 1; \frac{161}{40} \approx 4.03$$

3. $24 \times 24 \times 24$

$$S = 2(24 \times 24) + 2(24 \times 24) + 2(24 \times 24);$$

$$V = 24 \times 24 \times 24; \frac{1}{4} = 0.25$$

4. $7 \times 9 \times 22$

$$S = 2(7 \times 9) + 2(7 \times 22) + 2(9 \times 22);$$

$$V = 7 \times 9 \times 22; \frac{415}{693} \approx 0.60$$

5. $4 \times 16 \times 48$

$$S = 2(4 \times 16) + 2(4 \times 48) + 2(16 \times 48);$$

$$V = 4 \times 16 \times 48; \frac{2}{3} \approx 0.67$$

6. $25 \times 14 \times 33$

$$S = 2(25 \times 14) + 2(25 \times 33) + 2(14 \times 33);$$

$$V = 25 \times 14 \times 33; \frac{1637}{5775} \approx 0.28$$

Find the surface-area-to-volume ratio for each solid described below. Show all of your steps.

7. a cube with a surface area of 150 square units

$$s = \sqrt{\frac{150}{6}} = \sqrt{25} = 5;$$

$$V = 5 \times 5 \times 5; \frac{6}{5} = 1.2$$

8. a cube with a volume of 512 cubic units

$$s = \sqrt[3]{512} = 8;$$

$$S = 6(8 \times 8); \frac{3}{4} = 0.75$$

9. a rectangular prism with dimensions $4 \times 4 \times 4$

$$S = 6(4 \times 4);$$

$$V = 4 \times 4 \times 4; \frac{3}{2} = 1.5$$

10. a cube with a volume of 8000 cubic units

$$s = \sqrt[3]{8000} = 20;$$

$$S = 6(20 \times 20); \frac{3}{10} = 0.30$$

11. a rectangular prism with dimensions $4 \times 1 \times 1$

$$S = 2(4 \times 1) + 2(4 \times 1) + 2(1 \times 1);$$

$$V = 4 \times 1 \times 1; \frac{9}{2} = 4.5$$

12. a cube with a volume of 216 cubic inches

$$s = \sqrt[3]{216} = 6;$$

$$V = 6 \times 6 \times 6; 1$$

13. a rectangular prism with a diagonal length of 19 and a base of 10×15

$$h = \sqrt{19^2 - (10^2 + 15^2)} = 6; S = 2(15 \times 10) + 2(15 \times 6) + 2(10 \times 6);$$

$$V = 15 \times 10 \times 6; \frac{2}{3} \approx .67$$