

Revision Chapter 9

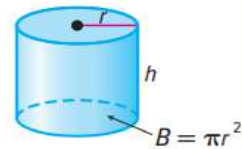
اسم الطالبة:
الصف:

1	أوجد حجم الأسطوانة.	مثال 2, 1, a	660
	Find the volume of the cylinder.	Example 1, 2, a	

Volume of a Cylinder

Words The volume V of a cylinder with radius r is the area of the base B times the height h .

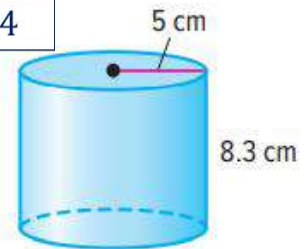
Model



Symbols $V = Bh$, where $B = \pi r^2$ or $V = \pi r^2 h$

Examples 1. Find the volume of the cylinder. Round to the nearest tenth.

Use $\pi = 3.14$



$$\begin{aligned} V &= \pi r^2 h \\ &= 3.14 \times (5)^2 \times 8.3 \\ &= 651.55 \text{ cm}^3 \\ &\approx 651.6 \text{ cm}^3 \end{aligned}$$

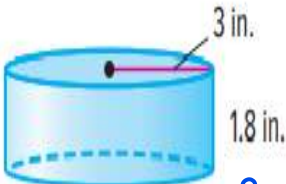
Examples 2. Find the volume of a cylinder with a diameter of 16 centimeters and a height of 20 centimeters. Round to the nearest tenth.

$$\begin{aligned} \textcircled{1} \quad r &= \frac{d}{2} = \frac{16}{2} = 8 \text{ cm} \\ \textcircled{2} \quad V &= 3.14 \times 8^2 \times 20 \\ &= 4019.2 \text{ cm}^3 \end{aligned}$$

1	أوجد حجم الأسطوانة.	مثال 2,1, a	660
	Find the volume of the cylinder.	Example 1, 2, a	

Find the volume of each cylinder. Round to the nearest tenth.

a.



$$V = 3.14 \times 3^2 \times 1.8$$

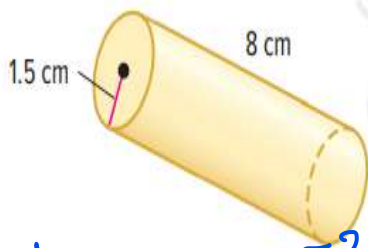
$$= 50.86 \text{ in}^3 \approx \boxed{50.9 \text{ in}^3}$$

b. diameter: 12 mm $r = \frac{d}{2} = \frac{12}{2} = 6 \text{ mm}$

height: 5 mm

$$V = 3.14 \times 6^2 \times 5$$

$$= \boxed{565.2 \text{ mm}^3}$$



$$V = 3.14 \times 1.5^2 \times 8$$

$$= 56.52 \text{ cm}^3$$

$$\approx \boxed{56.5 \text{ cm}^3}$$

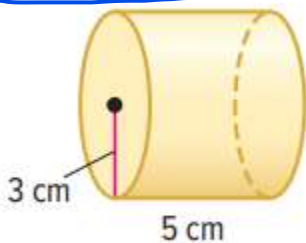
diameter: 8 cm. $r = \frac{d}{2} = \frac{8}{2} = 4$

height: 8 cm.

$$V = 3.14 \times 4^2 \times 8$$

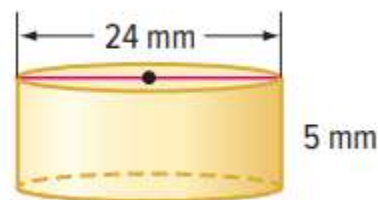
$$= 401.92 \text{ cm}^3$$

$$\approx \boxed{401.9 \text{ cm}^3}$$



$$V = 3.14 \times 3^2 \times 5$$

$$= \boxed{141.3 \text{ cm}^3}$$



$r = \frac{d}{2} = \frac{24}{2} = 12$

$$V = 3.14 \times 12^2 \times 5$$

$$= \boxed{2260.8 \text{ mm}^3}$$

2	أوجد حجم المخروط. Find the volume of the cone.	مثال 1, a, b Example 1, a, b	668
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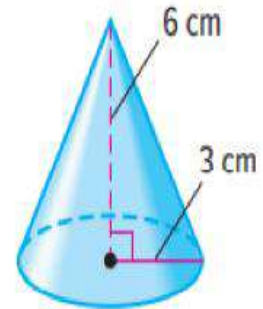
Examples 1. Find the volume of the cone. Round to the nearest tenth.

$$V = \frac{1}{3} \pi r^2 h$$

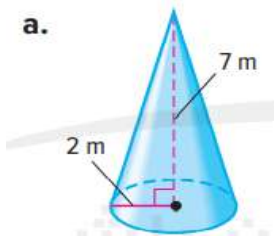
$$V = \frac{1}{3} \times 3.14 \times 3^2 \times 6$$

$$= 56.52 \text{ cm}^3$$

$$\approx 56.5 \text{ cm}^3$$



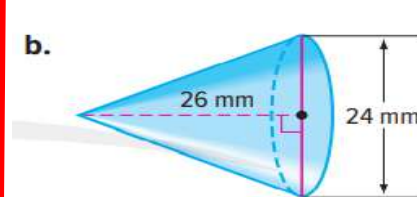
a.



$$V = \frac{1}{3} \times 3.14 \times 2^2 \times 7$$

$$= 29.3 \text{ m}^3$$

b.

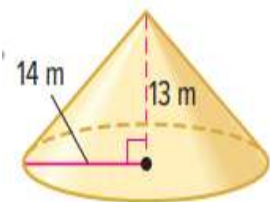


$$r = \frac{d}{2} = \frac{24}{2}$$

$$= 12$$

$$V = \frac{1}{3} \times 3.14 \times 12^2 \times 26$$

$$= 3918.7 \text{ mm}^3$$



$$V = \frac{1}{3} \times 3.14 \times 14^2 \times 13$$

$$= 2666.9 \text{ m}^3$$

height: 9 m

$$r = \frac{d}{2} = \frac{10}{2} = 5$$

diameter: 10 m

$$V = \frac{1}{3} \times 3.14 \times 5^2 \times 9$$

$$= 235.5 \text{ m}^3$$

3	حل مسائل حياتية على إيجاد حجم شكل كروي. Solve real world questions to find the volume of a spherical figure.	مثال 2, 1 Example 1, 2	676
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Examples 1. Find the volume of the sphere. Round to the nearest tenth.

$$V = \frac{4}{3} \pi r^3$$

$$V = \frac{4}{3} \times 3.14 \times 6^3$$

$$= 904.32 \text{ mm}^3$$



$$\approx 904.3 \text{ mm}^3$$

a.

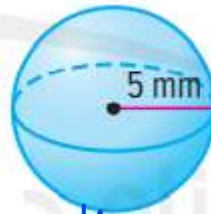


$$r = \frac{d}{2} = \frac{22}{2} = 11$$

$$V = \frac{4}{3} \times 3.14 \times 11^3$$

$$= 5572.5 \text{ cm}^3$$

b.



$$V = \frac{4}{3} \times 3.14 \times 5^3$$

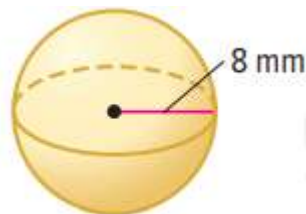
$$= 523.3 \text{ mm}^3$$



$$r = \frac{d}{2} = \frac{14.4}{2} = 7.2$$

$$V = \frac{4}{3} \times 3.14 \times 7.2^3$$

$$= 1562.7 \text{ cm}^3$$



$$V = \frac{4}{3} \times 3.14 \times 8^3$$

$$= 2143.6 \text{ mm}^3$$

3	حل مسائل حياتية على إيجاد حجم شكل كروي. Solve real world questions to find the volume of a spherical figure.	مثال 1، 2 Example 1, 2	676
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Examples 2. A spherical giant balloon has a diameter of about 8 meters. Find the volume of the spherical balloon. Round to the nearest tenth.

$$r = \frac{d}{2} = \frac{8}{2} = 4$$

$$V = \frac{4}{3} \times 3.14 \times 4^3$$

$$= 267.9 \text{ m}^3$$



5 The radius of a ball is 4.7 centimeters. What is the volume of the basketball? Round to the nearest tenth. (Example 2)

$$V = \frac{4}{3} \times 3.14 \times 4.7^3$$

$$= 434.7 \text{ cm}^3$$

6. Najat bought a game that contained a ball and 10 jacks. The ball had a radius of 2 centimeters. What is the volume of the ball? Round to the nearest tenth. (Example 2)

$$V = \frac{4}{3} \times 3.14 \times 2^3$$

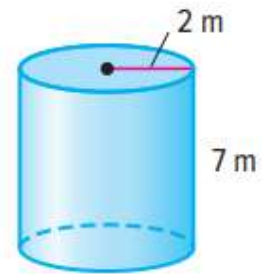
$$= 33.49 \text{ cm}^3 \approx 33.5 \text{ cm}^3$$

4	أوجد مساحة سطح الأسطوانة.	مثال 1, a, b	691
	Find the surface area of the cylinder.	Example 1, a, b	

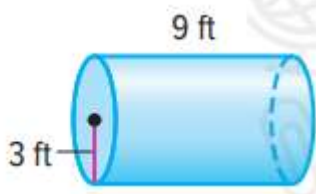
Examples 1. Find the surface area of the cylinder.
Round to the nearest tenth.

$$S.A. = 2\pi rh + 2\pi r^2$$

$$\begin{aligned} SA &= 2 \times 3.14 \times 2 \times 7 + 2 \times 3.14 \times 2^2 \\ &= 87.92 + 25.12 \\ &= 113.04 \approx \boxed{113.0 \text{ m}^2} \end{aligned}$$

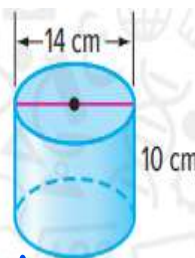


a.



$$\begin{aligned} SA &= 2 \times 3.14 \times 3 \times 9 + 2 \times 3.14 \times 3^2 \\ &= 169.56 + 56.52 \\ &= 226.08 \text{ ft}^2 \end{aligned}$$

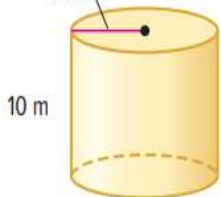
b.



$$r = \frac{d}{2} = \frac{14}{2} = 7$$

$$\begin{aligned} SA &= 2 \times 3.14 \times 7 \times 10 + 2 \times 3.14 \times 7^2 \\ &= 747.32 \text{ cm}^2 \end{aligned}$$

6 m



$$\begin{aligned} SA &= 2 \times 3.14 \times 6 \times 10 + 2 \times 3.14 \times 6^2 \\ &= 602.88 \text{ m}^2 \end{aligned}$$

8 cm

$$r = \frac{d}{2} = \frac{11}{2} = 5.5$$



$$\begin{aligned} SA &= 2 \times 3.14 \times 5.5 \times 8 + 2 \times 3.14 \times 5.5^2 \\ &= 466.29 \text{ cm}^2 \end{aligned}$$

5	حل مسائل حياتية على إيجاد مساحة سطح الأسطوانة.	مثال 2، c	691
	Solve real-world questions to find the surface area of the cylinder.	Example 2, c	

- Examples 2.** A circular fence that is 2 meters high is to be built around the outside of a carousel. The distance from the center of the carousel to the edge of the fence will be 12 meters. What is the area of the fencing material that is needed to make the fence around the carousel?

$$\begin{aligned}
 LA &= 2\pi rh = 2 \times 3.14 \times 2 \times 12 \\
 &= 150.72 \text{ m}^2 \\
 &\approx 151 \text{ m}^2
 \end{aligned}$$

- c. Find the area of the label of a can of tuna with a radius of 5.1 centimeters and a height of 2.9 centimeters. Round to the nearest tenth.

$$\begin{aligned}
 LA &= 2\pi rh = 2 \times 3.14 \times 5.1 \times 2.9 \\
 &= 92.88 \text{ cm}^2 \\
 &\approx 92.9 \text{ cm}^2
 \end{aligned}$$

8. Find the area of the label of a cylindrical potato chip container with a radius of 7.5 cm and a height of 22 cm. Round to the nearest tenth. (Example 2)

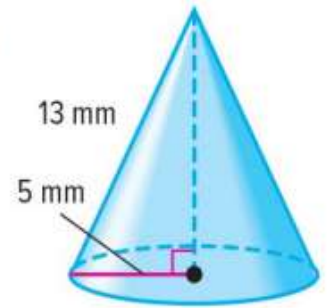
$$\begin{aligned}
 LA &= 2\pi rh \\
 &= 2 \times 3.14 \times 7.5 \times 22 = 1036.2 \text{ cm}^2
 \end{aligned}$$

6	أوجد المساحة الجانبية للمخروط.	مثال 1، a	702
	Find the lateral area of a cone.	Example 1, a	

Examples Find the lateral area of the cone. Round to the nearest tenth

$$L.A. = \pi r \ell$$

$$\begin{aligned} LA &= 3.14 \times 5 \times 13 \\ &= 204.1 \text{ mm}^2 \end{aligned}$$



- a. Find the lateral area of a cone with a radius of 4 centimeters and a slant height of 9.5 centimeters. Round to the nearest tenth.

$$\begin{aligned} LA &= 3.14 \times 4 \times 9.5 \\ &= 119.32 \text{ cm}^2 \\ &\approx 119.3 \text{ cm}^2 \end{aligned}$$

- b. Find the lateral area of a cone with a diameter of 16 centimeters and a slant height of 10 centimeters. Round to the nearest tenth.

$$r = \frac{d}{2} = \frac{16}{2} = 8 \text{ cm}$$

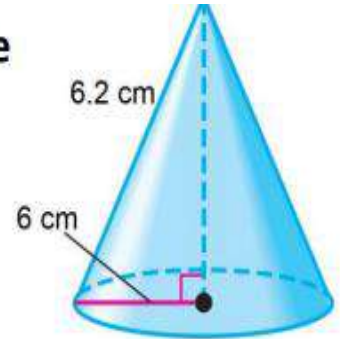
$$\begin{aligned} LA &= \pi r \ell = 3.14 \times 8 \times 10 \\ &= 251.2 \text{ cm}^2 \end{aligned}$$

7	أوجد مساحة سطح المخروط.	مثال 2، c	703
	Find the surface area of a cone.	Example 2, c	

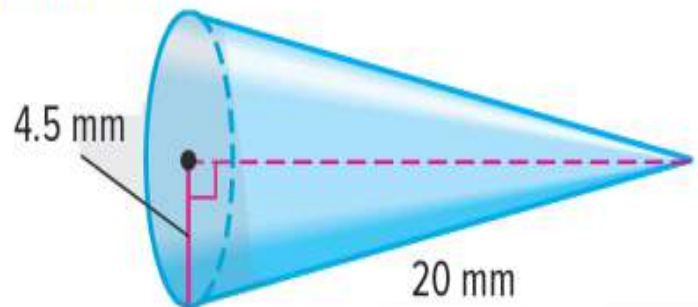
Examples Find the surface area of the cone. Round to the nearest tenth.

$$S.A. = L.A. + \pi r^2 \text{ or } S.A. = \pi r \ell + \pi r^2$$

$$\begin{aligned} SA &= 3.14 \times 6 \times 6.2 + 3.14 \times 6^2 \\ &= 229.84 \text{ cm}^2 \\ &\approx 229.8 \text{ cm}^2 \end{aligned}$$



Find the surface area of the cone. Round to the nearest tenth.

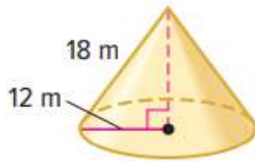


$$\begin{aligned} SA &= \pi r \ell + \pi r^2 \\ &= 3.14 \times 4.5 \times 20 + 3.14 \times 4.5^2 \\ &= 346.18 \text{ mm}^2 \\ &\approx 346.2 \text{ mm}^2 \end{aligned}$$

7	أوجد مساحة سطح المخروط.	مثال 2، c	703
	Find the surface area of a cone.	Example 2, c	

Find the lateral area of each cone. Round to the nearest tenth. (Example 1)

1. $LA = \pi r l$

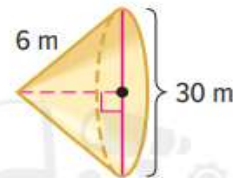


$$LA = 3.14 \times 12 \times 18$$

$$= 678.24 \text{ m}^2$$

$$\approx 678.2 \text{ m}^2$$

2. $r = \frac{d}{2} = \frac{30}{2} = 15$

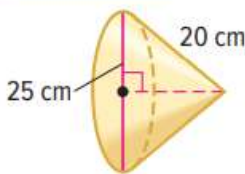


$$LA = 3.14 \times 15 \times 6$$

$$= 282.6 \text{ m}^2$$

Find the surface area of each cone. Round to the nearest tenth. (Example 2)

5. $SA = \pi r l + \pi r^2$



$$r = \frac{d}{2} = \frac{25}{2} = 12.5$$

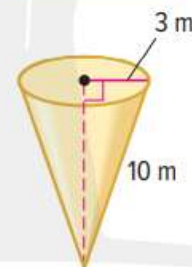
$$SA = 3.14 \times 12.5 \times 20 + 3.14 \times 12.5^2$$

$$= 785 + 490.625$$

$$= 1275.62 \text{ cm}^2$$

$$\approx 1275.6 \text{ cm}^2$$

6. _____



$$SA = 3.14 \times 3 \times 10 + 3.14 \times 3^2$$

$$= 94.2 + 28.26$$

$$= 122.46 \text{ m}^2$$

$$\approx 122.5 \text{ m}^2$$

8	أن يجد مساحة سطح شكل مشابه لشكل معطى مساحته إذا تم مضاعفة أطوال أبعاده أو ضربها بعدد.	مثال 1، a	712
	Find the are of a figure similar to a figure its area is given after double the length of its sides or multiply it by a number.	Example 1, a	

Surface Area of Similar Solids

If Solid X is similar to Solid Y by a scale factor, then the surface area of X is equal to the surface area of Y times the *square* of the scale factor.

Examples

The surface area of a rectangular prism is 78 square centimeters. What is the surface area of a similar prism with dimensions that are 3 times as great as the dimensions of the original prism?

$$SA_{\text{similar}} = 78 \times 3^2$$

$$= 702 \text{ cm}^2$$

- a. The surface area of a triangular prism is 34 square centimeters. What is the surface area of a similar prism with dimensions that are 3 times as great as the original prism?

$$SA_{\text{similar}} = 34 \times 3^2$$

$$= 306 \text{ cm}^2$$

- b. A giant box has a surface area of 352 square meters. If the dimensions of a similar box are smaller than the giant box by a scale factor of $\frac{1}{48}$, what is its surface area?

$$SA_{\text{similar}} = 352 \times \left(\frac{1}{48}\right)^2 = \frac{11}{72} \text{ m}^2$$

8	أن يجد مساحة سطح شكل مشابه لشكل معطى مساحته إذا تم مضاعفة أطوال أضلاعه أو ضربها بعدد.	مثال 1، a	712
	Find the are of a figure similar to a figure its area is given after double the length of its sides or multiply it by a number.	Example 1, a	

1. The surface area of a rectangular prism is 35 square centimeters. What is the surface area of a similar solid with dimensions that have been enlarged by

a scale factor of 7? (Example 1) $SA_{\text{similar}} = 35 \times 7^2 = 1715 \text{ cm}^2$

1. The surface area of a rectangular prism is 95 square centimeters. What is the surface area of a similar prism with dimensions that are 4 times as great as the original prism? (Example 1) _____

$$SA_{\text{similar}} = 95 \times 4^2 = 1520 \text{ cm}^2$$

2. The surface area of a pyramid is 57.8 square centimeters. What is the surface area of a similar pyramid with dimensions that are 2 times as great as the original prism? (Example 1) _____

$$SA_{\text{similar}} = 57.8 \times 2^2 = 231.2 \text{ cm}^2$$

3. A cereal box has a surface area of 280 square centimeters. What is the surface area of a similar box that is larger by a scale factor of 1.4? (Example 1) _____

$$SA_{\text{similar}} = 280 \times (1.4)^2 = 548.8 \text{ cm}^2$$

4. A glass display box has a surface area of 378 square centimeters. How many square centimeters of glass are used to create a glass display box with dimensions that are one-half those of the original?

$$SA_{\text{similar}} = 378 \times \left(\frac{1}{2}\right)^2 = 94.5 \text{ cm}^2$$