

Cylinders and Cones

For use after Section 12-3

Find the lateral area, total area, and volume of each cylinder.

- $r = 6, h = 8$; L.A. = 96π , T.A. = 168π , $V = \frac{288\pi}{3}$
 $LA = 2\pi \cdot 6 \cdot 8$
 $TA = 96\pi + 288\pi$
 $V = \pi \cdot 6 \cdot 8$
- $r = 5, h = 9$; L.A. = 90π , T.A. = 140π , $V = 225\pi$
 $LA = 2\pi \cdot 5 \cdot 9$
 $TA = 90\pi + 225\pi$
 $V = \pi \cdot 5 \cdot 9$
- The volume of a cylinder is 81π . If $r = 3$, find h . 9
 $81\pi = \pi \cdot 3^2 \cdot h$
- The volume of a cylinder is 36π . If $h = 4$, find the lateral area. 24π
 $36\pi = \pi r^2 \cdot 4$
 $3 = r^2$
 $r = \sqrt{3}$
 $LA = 2\pi \cdot \sqrt{3} \cdot 4$
- The volume of a cylinder is 150π . If $r = 5$, find h . 6
 $150\pi = \pi \cdot 5^2 \cdot h$
 $LA = \pi \cdot 6 \cdot 4$
- The lateral area of a cylinder is 100π . If $r = 5$, find h . 10
 $100\pi = 10\pi \cdot h$
- The total area of a cylinder is 144π . If $r = h$, find r . 6
 $144\pi = 2\pi r \cdot h + 2(\pi r^2)$
 $144\pi = 4\pi h^2$

Find the lateral area, total area, and volume of each cone.

- $r = 3, l = 10$; L.A. = 30π , T.A. = 39π , $V = \frac{3\pi\sqrt{91}}{3}$
 $LA = \frac{1}{2} \cdot 6\pi \cdot 10$
 $TA = 30\pi + 9\pi$
 $V = \frac{1}{3} \cdot 9\pi \cdot \sqrt{91}$
- $r = 7, h = 24$; L.A. = 175π , T.A. = 224π , $V = \frac{392\pi}{3}$
 $LA = \frac{1}{2} \cdot (14\pi) \cdot 25$
 $TA = 175\pi + 49\pi$
 $V = \frac{1}{3} \cdot (49\pi) \cdot (24)$
- A cone has radius 6 and slant height 10. Find the height, lateral area, total area, and volume.
 $h = 8$, L.A. = 60π , T.A. = 96π , $V = \frac{96\pi}{3}$
 $LA = \frac{1}{2} \cdot (36\pi) \cdot (8)$
 $TA = 60\pi + 36\pi$
 $V = \frac{1}{3} \cdot 36\pi \cdot 8$
- A cone has radius 5 and volume 100π . Find the height, slant height, lateral area, and total area.
 $h = 12$, $l = \sqrt{13}$, L.A. = 65π , T.A. = 90π , $V = \frac{90\pi}{3}$
 $100\pi = \frac{1}{3} \cdot \pi \cdot 5^2 \cdot h$
 $12 = h$
 $LA = \frac{1}{2} \cdot (20\pi) \cdot (13)$
 $TA = 65\pi + \pi(5)^2$
- A cone and a cylinder both have height 7 and radius 3. Find the ratio of their volumes without actually calculating them. 1:3
- Cylinder A has radius 4 and height 6. Cylinder B has radius 6 and height 4.
 a. B has the greater volume.
 $V_A = \pi \cdot 4^2 \cdot 6$
 $= 96\pi$
 $V_B = \pi \cdot 6^2 \cdot 4$
 $= 144\pi$
- Mike has the greater lateral area.
 $LA_A = 2\pi \cdot 4 \cdot 6$
 $= 48\pi$
 $LA_B = 2\pi \cdot 6 \cdot 4$
 $= 48\pi$
- Cone E has radius 9 and height 12. Cone F has radius 12 and height 9.
 a. F has the greater volume.
 b. F has the greater lateral area.
- The lateral area of a cone is 32π and the slant height is 8. Find the radius, height, total area, and volume.
 $r = 4$, $h = 4\sqrt{3}$, T.A. = 48π , $V = \frac{64\pi\sqrt{3}}{3}$

