# Guide to: Cylinders

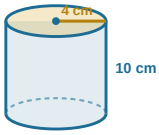
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**Explanation:**

A cylinder with radius ***r*** and height ***h*** is a circular prism, so its **Volume** is the area of the circular base times the height: **Volume = $\pi r^2 h$**.

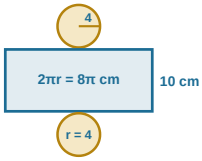
For the **total surface area of a solid cylinder**, unroll the curved side into a rectangle of width $2\pi r$ (the circumference) and height $h$, and add the two circular ends: **Total Surface Area = $2\pi r^2 + 2\pi rh$**.

**Example 1:** A cylinder has radius **4 cm** and height **10 cm**. Calculate its **volume** to **1 d.p.**




$V = \pi r^2 h$
$= \pi \times 4^2 \times 10 =$ **$160\pi$**
$=$ **$502.7\ cm^3$**

**Example 2:** Calculate the **total surface area** of a solid cylinder with radius **4 cm** and height **10 cm** to **1 d.p.**




2 ends = $2\pi(4^2) =$ **$32\pi$**
Curved = $8\pi \times 10 =$ **$80\pi$**
$112\pi =$ **$351.9\ cm^2$**

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