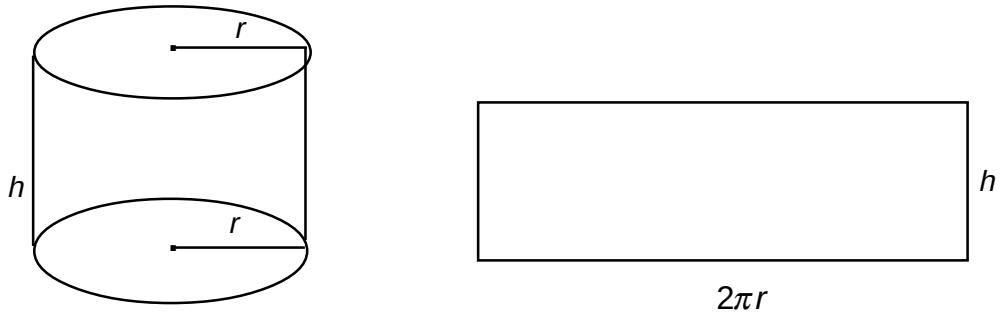
Math Study Strategies

Math for Air Conditioning and Refrigeration

Surface Areas of Cylinders and Cones

The surcace area of a cylinder is the sum of the areas of the two bases and the area of the curved surface. In water heaters, the area of the curved surface is called the lateral surface area.



If you would cut the cylinder open and lay it flat, you would find that the lateral surface area is the area of a rectangle. This rectangle has a length equal to the circumference of the base of the cylinder. The height of the rectangle would be equal to the height of the cylinder.

The lateral surface area of a cylinder is:

$$LA = 2\pi rh$$

The area of each of the bases of the cylinder is:

$$A = \pi r^2$$

To find the total surface area (lateral surface area plus the area of the **two** bases) of a right circular cylinder, use the formula:

$$SA = LA + A = 2\pi rh + 2\pi r^2$$

Some people wrap water heaters to keep in the heat. If a water heater is 1.5 feet in diameter and 5 feet tall, how much wrap is needed?

Diameter	= 1.5 ft.
Radius	= 0.75 ft.
height	= 5 ft.

Lateral surface area (LA) 2 x π x 0.75 x 5 = 23.56 square ft.

Area of base $(A_B) = \pi(0.75)^2 = 0.56$

Total surface area $(TA)SA + 2(A_B) = 23.56 + 2(0.56) = 25.06$ square feet.