Problem 60

Estimate the surface area of a person.

Solution

Assume that a person can be modelled by a cylinder with a height of 6 feet and a radius of 1 foot. The surface area of a cylinder is the area of the two circles and the lateral area.

$$\text{Cylinder Surface Area} = 2\pi r^2 + 2\pi rh = 2\pi r(r+h)$$

Plug in the values for r and h and convert the answer to cubic meters.

$$\text{Human Surface Area} = 2\pi(1\text{ ft})(1\text{ ft} + 6\text{ ft}) = 14\pi\text{ ft}^2 = 14\pi\ \cancel{\text{ft}^2} \times \left(\frac{381}{1250\ \cancel{\text{ft}}}\right)^2 \approx 4\text{ m}^2$$

Therefore, the surface area of a person is roughly several square meters.