

Antarctica is roughly semicircular, with a radius of 2000 km (see the figure). The average thickness of its ice cover is 3000 m. How many cubic centimeters of ice does Antarctica contain? (Ignore the curvature of Earth.)

Solution.

Find the area of the Antarctic ice

$$S = \pi * R^2 = 3.14 * 2000000 = 1.257 \cdot 10^{13} \text{m}$$

Find the volume of ice in Antarctica

$$V = S * h = 1.257 \cdot 10^{13} * 3000 = 3.77 \cdot 10^{16}$$

Convert cubic meters to cubic centimeters

$$\frac{3.77 \cdot 10^{16}}{10^{-6}} = 3.77 \cdot 10^{22}$$

Answer: $3.77 \cdot 10^{22}$ cubic centimeters