



π IN THE SKY⁹

Answer Key

Core Conundrum

What is the density of Mars' core?



1. Convert km to cm.

$$1,830 \text{ km} \cdot (100,000 \text{ cm} / 1 \text{ km}) = 183,000,000 \text{ cm} = 1.83 \cdot 10^8 \text{ cm}$$

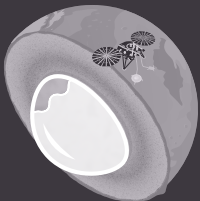
2. Calculate the volume of Mars' core.

$$V = 4/3\pi r^3$$

$$V = 4/3\pi(1.83 \cdot 10^8 \text{ cm})^3$$

$$V \approx 4/3\pi(6.13 \cdot 10^{24} \text{ cm}^3)$$

$$V \approx 2.57 \cdot 10^{25} \text{ cm}^3$$

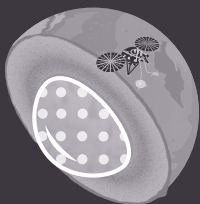


3. Convert kg to g.

$$(1.54 \cdot 10^{23} \text{ kg}) \cdot (1,000 \text{ g} / 1 \text{ kg}) = 1.54 \cdot 10^{26} \text{ g}$$

4. Divide the mass of Mars' core by its volume.

$$(1.54 \cdot 10^{26} \text{ g}) / (2.57 \cdot 10^{25} \text{ cm}^3) \approx 5.99 \text{ g/cm}^3$$



How does that compare to the density of Earth's core?

Mars' core is less dense.

What does that tell us about the makeup of Mars' core?

Mars' core is made of less dense material than Earth's core.

