π IN THE SKY 9

Answer Key

Core Conundrum

What is the density of Mars' core?

1. **Convert km to cm.**

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

2. **Calculate the volume of Mars' core.**

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

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

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

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

3. **Convert kg to g.**

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

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

   $(1.54 \bullet 10^{26}\ \text{g}) / (2.57 \bullet 10^{25}\ \text{cm}^3) \approx$ 5.99 g/cm³

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.