

$p = \text{planet}$

$E = \text{Earth}$

4. (10 points) Imagine that a planet has a diameter that is 3 times that of the Earth and a mass that is 5 times that of the Earth. What is its density? Is it a jovian-type planet or a terrestrial-type planet?

$$D_p = 3D_E \Rightarrow R_p = 3R_E$$

$$M_p = 5M_E$$

$$\text{density} = \frac{M}{\frac{4}{3}\pi R^3}$$

$$\text{density}_p = \frac{M_p}{\frac{4}{3}\pi R_p^3} = \frac{5M_E}{\frac{4}{3}\pi (3R_E)^3} = \frac{5}{27} \frac{M_E}{\frac{4}{3}\pi R_E^3} = \frac{5}{27} \text{density}_E$$

$$\text{density}_E = \frac{M_E}{\frac{4}{3}\pi R_E^3} = 5520 \frac{\text{kg}}{\text{m}^3}$$

$$\text{density}_p = 1020 \frac{\text{kg}}{\text{m}^3}$$

the planet is a jovian-type planet

Each of the following multiple choice questions is worth 4 points. There is only one best answer to any of the questions.

5. The Asteroid Belt (rocky and metallic objects) is located between the orbits of

- a) Earth and Mars
- b) Mars and Jupiter
- c) Jupiter and Saturn
- d) Uranus and Neptune
- e) Neptune and Pluto

B