

Homework 5

CH10: 9). The chemical composition of Jupiter and Saturn are most similar to those of:
D - The Sun

37). $R_{\text{Jup}} = 71,500 \text{ km}$; $o = 0.065$; $R_{\text{pol}} = ?$

$$0 = \frac{R_{\text{Jup}} - R_{\text{pol}}}{R_{\text{Jup}}} = 1 - \frac{R_{\text{pol}}}{R_{\text{Jup}}}$$

$$R_{\text{pol}} = R_{\text{Jup}} (1 - o) = 71,500 \text{ km} (1 - 0.065)$$

$$R_{\text{pol}} \approx 66,900 \text{ km}$$

CH11: 6). Saturn's bright rings are located within the Roche limit of Saturn. This fact supports the theory that these rings:
A - Formed of moons torn apart by tidal stresses.

8). If a moon revolves opposite to its planet's rotation, it probably:

A: Was captured after the planet formed.

$$35). \dot{d} = 3 \text{ mm/yr}$$

$$a). r = 1,820 \text{ km} \quad A = ? \quad V = ?$$

$$A = 4\pi r^2 = \boxed{4.16 \times 10^7 \text{ km}^2}$$

$$V = \frac{4}{3}\pi r^3 = \boxed{2.53 \times 10^{10} \text{ m}^3}$$

$$b). V_{\text{volc}} = \frac{4}{3}\pi (1,820,000000 \text{ m}^3 - 1,820^3) = \boxed{124.87 \text{ km}^3}$$

the volcanic deposit is $124.87 \text{ km}^3/\text{yr}$

$$c). t = V/V_{\text{volc/yr}}$$
$$= \frac{2.53 \times 10^{10}}{124.87}$$
$$= \boxed{2.03 \times 10^8 \text{ yr}}$$

$$d). \text{Age of Solar System} = t_{\text{ss}} \approx 5 \times 10^9 \text{ yr}$$
$$\#_{\text{inside/out}} = \frac{5 \times 10^9 \text{ yr}}{2.03 \times 10^8 \text{ yr}} = \boxed{24.63 \text{ times}}$$