

The Sun and its Planets - Homework #1 Solutions

15).

- B - Hydrogen and helium are made in the Big Bang
- D - Stars are born and process light elements into heavier ones
- A - Stars die and distribute heavy elements into the space between the stars
- C - Enriched dust and gas gather into clouds in interstellar space
- E - The Sun and planets form from a cloud of interstellar dust and gas

36).  $x=384,400\text{km}$ ;  $t=3\text{ days}=72\text{ hours}$

$$\bar{v} = x \div t$$

$$\bar{v} = 388,400\text{km} \div 72\text{h} \approx 5339\text{km/h}$$

This is much faster than jet aircraft at 800km/h

9). You see the Moon on the meridian at sunrise. The phase of the Moon is:  
d. third quarter

31).  $v = 1,674\text{km/h}$ ;  $t = 24\text{h}$

$$D = (1,674\text{km/h} \times 24\text{h}) \div \pi = 40,176\text{km} \div \pi \approx 12,753\text{km}$$

Since the Earth rotates at the given velocity, multiplying it by the length of a full day-allowing time for one full rotation- would give the total distance needed to go around the Earth's equator once, or its circumference. To find the diameter of the Earth from the calculated circumference, divide the circumference by  $\pi$  (Circumference = Diameter \*  $\pi$ , therefore Diameter = Circumference  $\div \pi$ )

38). **Extra Credit:**  $x_1 = 56 \cdot 10^6\text{km}$ ;  $x_2 = 400 \cdot 10^6\text{km}$

$$\text{speed of light} = c = 3 \cdot 10^5\text{km/h}$$

$$t_1 = x_1 \div c = 56 \cdot 10^6\text{km} \div 3 \cdot 10^5\text{km/h} \approx 186\text{ seconds} \approx 3\text{ minutes}$$

$$t_2 = x_2 \div c = 400 \cdot 10^6\text{km} \div 3 \cdot 10^5\text{km/h} \approx 1,333\text{ seconds} \approx 22\text{ minutes}$$