

Homework #8
AS101 Summer 2006
Dr. Withers

GRADE SHEET

Assigned: 2006.06.08
Due: 2006.06.09, start of class

1) Read Chapter 8

2) Purpose: Understand the nebular theory of solar system formation.
As the solar system formed, a cloud of gas collapsed inwards and heated up. its temperature increased due to the conservation of:

- A) Energy
- B) Momentum
- C) Angular momentum
- D) Mass

A) Energy 25 pts

3) Purpose: Understand why the inner and outer regions of the solar system differ.
The temperature of the solar nebula controlled whether water was able to condense or not. The boundary between the hot inner region where water could not condense and the cool outer region where water could condense is called _____

The frost line 25 pts

4) Purpose: Be able to solve radioactivity calculations.
Radioactive decay provides scientists with a “clock” that is used to measure when the solar system formed. What equation links the amount of radioactive material to the half-life? Define all terms in your equation.

$$N / N_0 = (1/2)^{(t/X)} \qquad 15 \text{ pts}$$

N is the current amount of a radioactive substance in a rock, N₀ is the original amount, t is the time since the rock formed, and X is the half-life of the radioactive substance.

- Terms defined wrongly or only some terms defined 5 pts
- All terms defined correctly 10 pts

5) Purpose: Understand the origin of some unusual features of the solar system.
Giant impacts are probably responsible for:

- A) Saturn’s rings and Earth’s Moon
- B) The Asteroid Belt and the thick atmosphere of Venus
- C) Pluto’s eccentric orbit and Jupiter’s Great Red Spot
- D) Earth’s Moon and Uranus’ unusual tilt

D) Earth’s Moon and Uranus’ unusual tilt 25 pts