Astronomy 150 – Midterm

Name: _____

April 27, 2006 – Spring 2006

TA's Name & Section (2 pts): _____

Answer all questions in the space provided. If you have any questions, raise your hand. 100 points possible. No calculators.

You have discovered a new planet orbiting the Sun at a distance of 0.7 AU. This planet is half (1/2) the size of the Earth, and an eighth (1/8) as massive.

1 (4 pts) How does the gravity of this planet compare to the Earth's gravity? [Be quantitative; show your work.]

2 (6 pts) Would you expect the geological activity on this world to be greater or less than the Earth's? Explain your answer.

3 (6 pts) Explain why it is very **unlikely** that this world would have an atmosphere.

4 (6 pts) Explain why it is possible to build **higher** mountains on Mars than it is on the Earth.

5 (6 pts) Explain why a radioactive isotope with a half-life of 1 million years is **not** very useful for determining the ages of Moon rocks.

6 (6 pts) Most impact craters currently being discovered on the Earth are buried deep underground. Explain how we can tell these are impact craters even though there is nothing to see at the surface.

7 (6 pts) Explain why the lack of volatiles in the Earth-Moon system implies that the Earth-Moon system was subjected to intense heating.

8 (6 pts) The Mars Rovers have seen evidence of heavily weathered rocks on the surface of Mars. If this weathering had continued until today, how would the composition of Mars' atmosphere be different?

9 (6 pts) Explain why simple impact craters were visited by every Apollo mission as well as by both Mars Rovers. [Hint: it is not only because they are common on the Moon and Mars.]