

Astronomy 150 - Exam #1

Name: _____

October 24, 1997

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

Answer all questions in the space provided. Please write in complete sentences. If you have any questions raise your hand. 100 points possible.

1 (5 pts) Apollo 15 landed next to Hadley Rille (a sinuous rille). Describe how this feature was formed and what types of rocks would you expect to find in Hadley Rille.

2 (5 pts) I said in class that the surface of Mercury and the Lunar highlands are about the same age because they have about the same crater density. Explain why this assumption may not be correct.

3 (3 pts) How would you find the **absolute** age of the surface of Mercury?

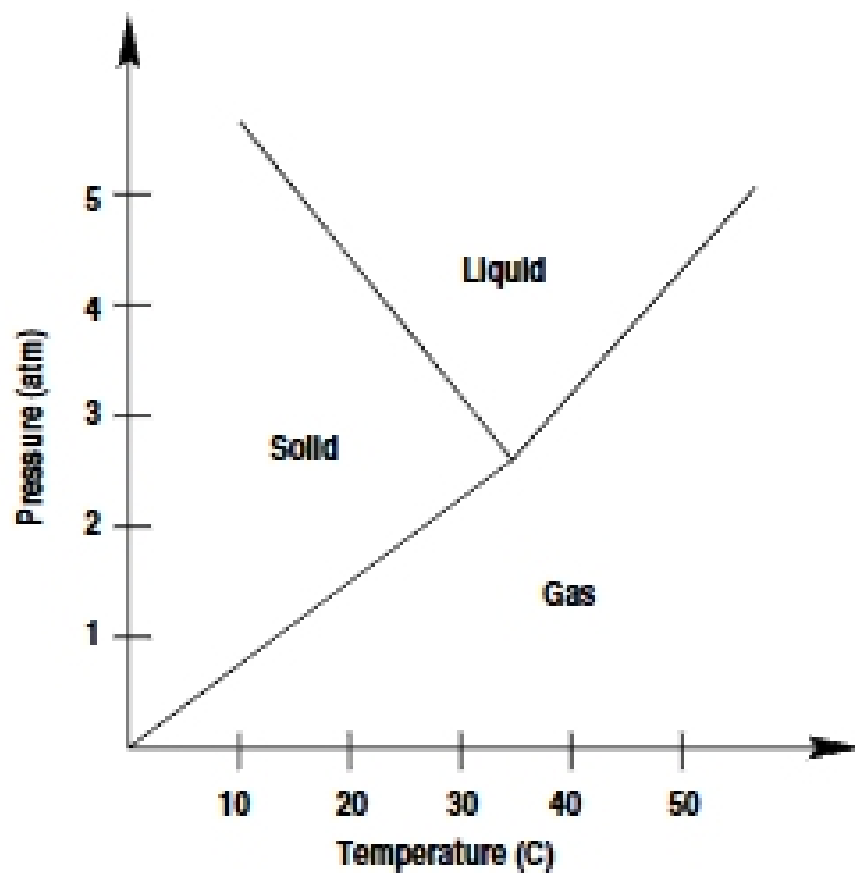
You have discovered an airless planet orbiting between the Earth and Mars. You measure its **compressed** density to be $\rho = 6 \text{ gm/cm}^3$ and its **uncompressed** density to be $\rho = 4 \text{ gm/cm}^3$.

4 (3 pts) Describe the approximate composition of this planet.

5 (4 pts) Is this world larger or smaller than Mars? Explain your answer.

6 (5 pts) If you were to half the size of the Earth (shrink its radius by a factor of two) and double the mass of the Earth, how much would it change the gravity on the Earth (how much would your weight change)? [show your work]

7 (10 pts) All of the worlds we have studied so far have impact craters. Pick one world (Mercury, Venus, or Mars) and describe two ways the impact craters on that world differ from impact craters on the Moon.



This is the phase diagram for a substance called Oobleck. Use it to answer the following three questions.

8 (2 pts) If the temperature in this room were 10 C what phase would Oobleck be in? (check one)

- Solid
- Liquid
- Gas

9 (5 pts) If I were to raise the temperature in this room slowly from 10 C to 55 C describe what would happen to the Oobleck.

10 (5 pts) If I were to increase the air pressure in this room to 4 times its normal value and then increase the room temperature slowly from 10 C to 55 C describe what would happen to the Oobleck.