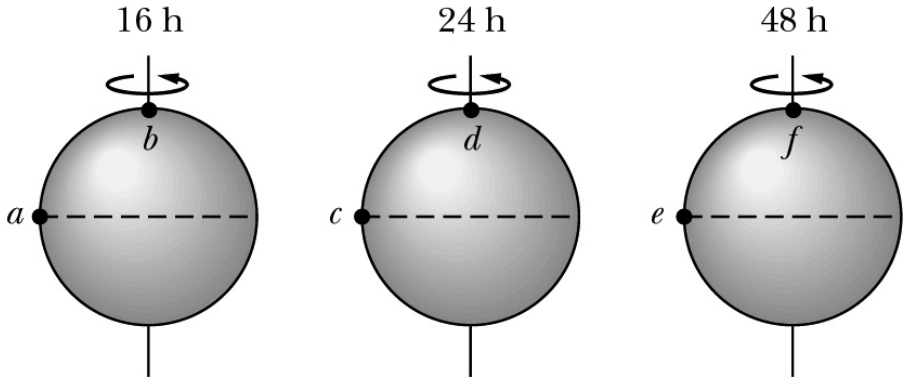
Physics 407 **Concept Quiz 11 (Dec 4, 2001)**

Name:_____ **SS#:_____**

1) Gravitation on a planet



The figure shows three uniform *spherical* planets that have the same mass and size. The period of rotation is indicated at the axis of each planet. The free fall acceleration *g* is measured in six locations on the planets that are indicated by letters. Rank the locations according to the free fall acceleration (highest first) in the boxes below from left to right. Use the same box for equal values.

2.5 Points

For a realistic planet, the assumption of a spherical shape is incorrect. How would the planets be deformed?

_____ **2.5 Points**

2) Interstellar Exploration

The crew of the Enterprise has arrived in a new star system with one inhabitable planet. The star has a mass M that is 2 times the mass of the sun. The planet is at 2 times the distance of the earth from the sun.

Is the gravitational force of the star on the planet

a) weaker than **b)** stronger than **c)** the same as

the gravitational force of the sun on the Earth? **2.5 Points**

How long is one "planet year" on that new planet in terms of Earth years?

a) 1 year **b)** 1/2 year
c) 2 years **d)** 4 years
e) 8 years **2.5 Points**

Hint: Use Kepler's 3rd Law Distance^3/Period^2 = Constant*Mass(Star)