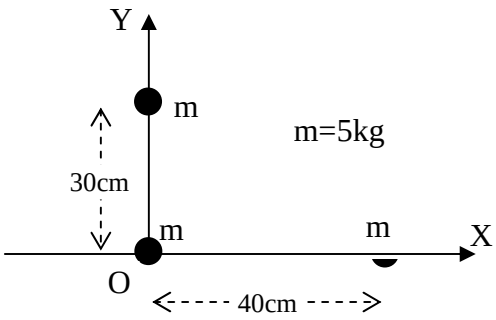
Help Session 7-(Fuad Enaya)
27/12/2004
CH # 14&15

Q1. A satellite circles a planet (mass M = 5.0×10^{24} kg) every 98 min. What is the radius of the orbit?

Correct Answer: 6.6×10^{6} m

Q2. Three 5.0 kg masses are located at points in the xy plane as shown in the Fig.4. What is the magnitude of the resultant force caused by the other two masses on the mass at the origin?



Correct Answer: 2.1x10**(-8) N

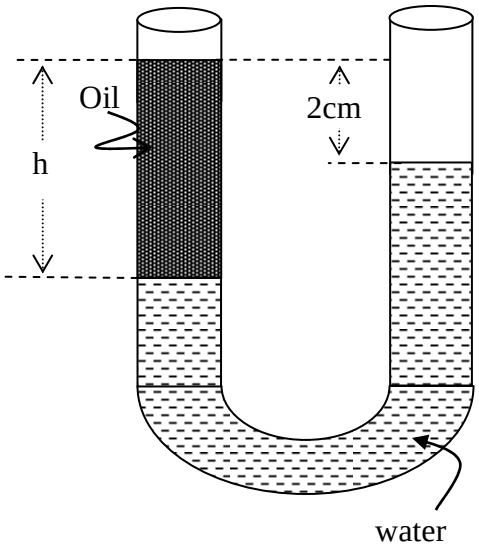
Q3. A rocket is fired vertically from the surface of a planet (mass = M, radius = R). What is the initial speed of the rocket if its maximum height above the surface of the planet is 2R ? (Assume there is no air resistance)

Correct Answer: SQRT(4GM/3R)

Q4. A spaceship (mass = m) orbits a planet (mass = M) in a circular orbit (radius = R). What is the minimum energy required to make the spaceship escape the gravitational force of the planet?

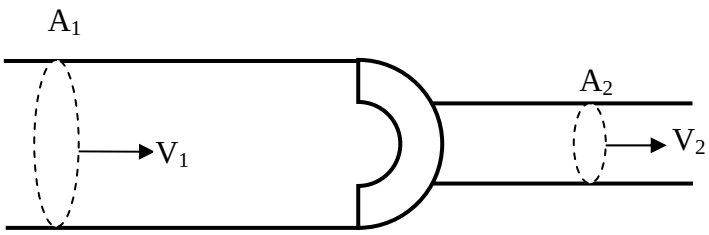
Correct Answer: GmM/(2R)

Q5. **The density of water and oil are 1.0 g/cm^3 and 0.80 g/cm^3 respectively. The height h of the column of oil, shown in Fig.5: is:**



Correct Answer: 10 cm

Q6. **An incompressible ideal liquid flows along the pipe as shown in Fig.6. The ratio of the speeds v2/v1 is:**



Correct Answer: A1/A2

Q7. **A liquid of density 791 kg/m**3 flows smoothly through a horizontal pipe (see Fig. 6). The area A2 equals A1/2. The pressure difference between the wide and the narrow sections of the pipe (P1-P2) is 4120 Pa. What is the speed v1?**

Correct Answer: 1.86 m/s

Q8. Bernoulli's equation can be derived from the conservation of:

A1 energy A2 mass A3 angular momentum A4 volume A5 pressure

With My Best Wishes

Fuad