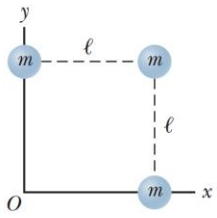
WS # 2 Chapter 13 pr9,13,15,17,24

Problems

9. Two objects attract each other with a gravitational W force of magnitude 1.00×10^{-8} N when separated by 20.0 cm. If the total mass of the two objects is 5.00 kg, what is the mass of each?

13. Miranda, a satellite of Uranus, can be modeled as a sphere of radius 242 km and mass 6.68×10^{19} kg.
(a) Find the free-fall acceleration on its surface.
(b) A cliff on Miranda is 5.00 km high. If a devotee of extreme sports runs horizontally off the top of the cliff at 8.50 m/s, for what time interval is he in flight? (c) How far from the base of the vertical cliff does he strike the icy surface of Miranda? (d) What will be his vector impact velocity?

15. Three objects of equal mass are located at three corners of a square of edge length ℓ as shown in Figure P13.15. Find the magnitude and direction of the gravitational field at the fourth corner due to these objects.



17. An artificial satellite circles the Earth in a circular orbit at a location where the acceleration due to gravity is 9.00 m/s^2. Determine the orbital period of the satellite.

24. The *Explorer VIII* satellite, placed into orbit November 3, 1960, to investigate the ionosphere, had the following orbit parameters: perigee, 459 km; apogee, 2 289 km (both distances above the Earth's surface); period, 112.7 min. Find the ratio v_p/v_a of the speed at perigee to that at apogee.

9) 2 & 3 kg 13)0.0761 m/s^2, 363 s, 3080m, 28.9 m/s @ 72.9o 15) $\frac{Gm}{l^2}(\sqrt{2}+\frac{1}{2})$ 17) 5410 s 23) 1.27