

56. (a) From Eq. 14-44, we see that the energy of each satellite is  $-GM_E m/2r$ . The total energy of the two satellites is twice that result;  $-GM_E m/r$ .
- (b) We note that the speed of the wreckage will be zero (immediately after the collision), so it has no kinetic energy at that moment. Replacing  $m$  with  $2m$  in the potential energy expression, we therefore find the total energy of the wreckage at that instant is  $-2GM_E m/r$ .
- (c) An object with zero speed at that distance from Earth will simply fall towards the Earth, its trajectory being toward the center of the planet.