10. A particle of mass m is attached to the end of a light string of length l. The other end of the string is passed through a small hole and is slowly pulled through it. Gravity is negligible. The particle is originally spinning round the hole with angular velocity ω. Find the angular velocity when the string length has been reduced to $\frac{1}{2}l$. Find also the tension in the string when its length is r, and verify that the increase in kinetic energy is equal to the work done by the force pulling the string through the hole.