

Week 55 (9/29/03)

### Fixed highest point

Consider a top made of a uniform disk of radius  $R$ , connected to the origin by a massless stick (which is perpendicular to the disk) of length  $\ell$ , as shown below. Paint a dot on the top at its highest point, and label this as point  $P$ . You wish to set up uniform circular precession, with the stick making a constant angle  $\theta$  with the vertical, and with  $P$  always being the highest point on the top. What relation between  $R$  and  $\ell$  must be satisfied for this motion to be possible? What is the frequency of precession,  $\Omega$ ?

