



A ring of weight W , with radius a and centre O , is at rest on a rough surface that is inclined to the horizontal at an angle α where $\tan \alpha = \frac{1}{2}$. The plane of the ring is perpendicular to the inclined surface and parallel to a line of greatest slope of the surface. The point P on the circumference of the ring is such that OP is parallel to the surface.

A light inextensible string is attached to P and to the point Q , which is on the surface, such that PQ is horizontal (see diagram). The points O , P and Q are in the same vertical plane. The system is in limiting equilibrium and the coefficient of friction between the ring and the surface is μ .

- (a) Find, in terms of W , the tension in the string PQ . [4]
- (b) Find the value of μ . [3]