

Example (Inclined Plane)

A particle is held at rest on a rough plane, which is inclined to the horizontal at an angle α , where $\tan \alpha = 0.75$. The coefficient of friction between the particle and the plane is 0.5. The particle is released and slides down the plane. Find:

- a) The acceleration of the particle
- b) The distance it slides in the first two seconds

Test Your Understanding

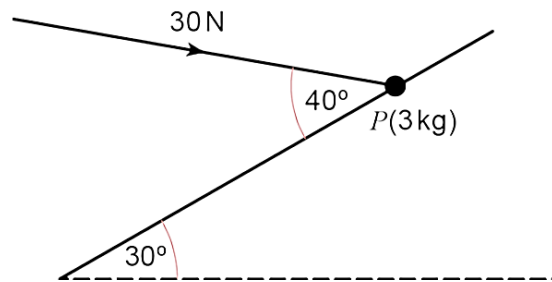
1. A particle P of mass 3 kg is held at rest in equilibrium on a rough plane that is inclined to the horizontal at an angle of 30° by a constant force of magnitude $x\text{N}$ acting up the plane.

The coefficient of friction between P and the plane is 0.5. Find the magnitude of x if:

- a) The particle is on the point of slipping up the plane
- b) The particle is on the point of slipping down the plane

2. A particle P of mass 3 kg is held at rest in equilibrium on a rough plane that is inclined to the horizontal at an angle of 30° by a constant force of magnitude 30 N . The direction of the force is inclined to the plane at an angle of 40° , and its line of action lies in the vertical plane containing P and a line of greatest slope of the plane. The coefficient of friction between P and the plane is μ .

Given that P is on the point of sliding **up** the plane, find the value of μ .



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