

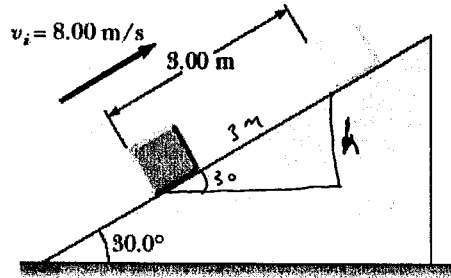
Phys101 **Quiz # 5 (Ch.8)** sec # 37

Name: _____

ID # _____

Key

A 5-kg block is set into motion up a rough inclined plane with an initial speed of 8 m/s. The block comes to rest after traveling 3 m along the plane, which is inclined at an angle of 30 to the horizontal. Determine the coefficient of kinetic friction μ_k between the block and the inclined plane.



$$h = d \sin 30$$

$$F_N = mg \cos 30$$

$$\Delta K + \Delta U_g + \Delta E_{th} = 0$$

$$\frac{1}{2} m (v_f^2 - v_i^2) + mgh + \mu_k F_N d = 0$$

$$-\frac{1}{2} m v_i^2 + mgd \sin 30 + \mu_k mg \cos 30 d = 0$$

$$-\frac{1}{2} (5)(8^2) + 5(9.8)(3) \sin 30 + \mu_k (5)(9.8) \cos 30 (3) = 0$$

$$\mu_k = 0.679$$