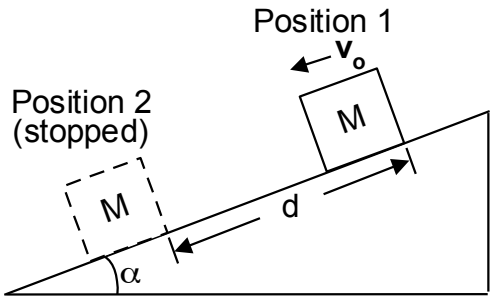
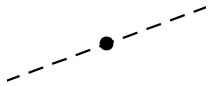
1. A block of mass M is sliding down a plane inclined at angle α with the horizontal. The coefficient of kinetic friction between the plane and the block is μ_k. At Position 1, the velocity of the block is $\mathbf{v_o}$. The block slows down and comes to a stop at Position 2, which is a distance d along the plane from Position 1.



a. Draw and label the 3 forces acting on the block in Position 1. (The dashed line indicates the incline.)



b. Draw an **F-d diagram** for the normal force. Write the definition of work (***not*** W = Fd) and then apply it to the work done by the normal force. Give your result for the work done by the normal force on the block as the block moves through distance d.

c. Repeat step b for the work done by the weight force on the block. Give your result in terms of the given symbols and g. Don't confuse the angle α with θ in the definition of work.

d. Repeat step c for the work done by the friction force on the block. Remember to give your result in terms of the given symbols and g only.

e. Use the work-energy theorem to explain why the sum of your three work terms in parts b-d should be equal to $-\frac{1}{2}mv_o^2$.