2C Work-Energy Principle

1. A smooth plane is inclined at 30° to the horizontal. A particle of mass 0.5kg slides down the slope. The particle starts from rest at point A and at point B has a speed of $6ms^{-1}$. Find the distance AB.

2. A particle of mass 2kg is projected with speed $8ms^{-1}$ up a rough plane inclined at 45° to the horizontal. The coefficient of friction between the particle and the plane is 0.4. Calculate the distance the particle travels up the plane before it comes to instantaneous rest.

3. A skier passes a point A on a ski-run, moving downhill at $6ms^{-1}$. After descending 50m vertically, the run starts to ascend. When the skier has ascended 25m to point B her speed is $4ms^{-1}$. The skier and skis have a combined mass of 55kg. The total distance travelled from A to B is 1400m. The resistances to motion are constant and have a magnitude of 12N.
   Calculate the work done by the skier.