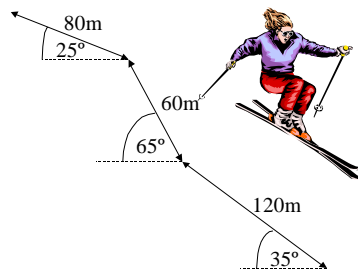## Problems Class 2

You ski down the hill illustrated in the figure below on waxed skis that are almost frictionless. What are the forces acting on you? Ignoring the drag force, determine the total work done on you as you ski from the top to the bottom of the hill, if your mass is 85 kg.

80m

25°

60m

65°

120m

35°

What is your speed at the bottom of the hill?

Problems Class 2

We glibly say "work equals force times distance in the direction of the force". So if a force is applied, but no motion occurs, no work is done. Why, then, does someone holding a heavy weight at arms length get tired and hot and have to put the weight down for a rest after a short while? Discuss!

Problems Class 2

You are driving from Liverpool to Manchester, a distance of 38 miles. Assuming that you can travel at a constant speed the whole way and that the road is flat, work out how much more petrol you will need if your speed is 50mph rather than 40mph. At 40mph your car does 42mpg.