10 A rescue worker is lowered from a helicopter on a rope. She attaches a second rope to herself and to a woman in difficulties on the ground. The helicopter winches both women upwards with the rescued woman vertically below the rescue worker, as shown in the diagram.

The model for this motion uses the following modelling assumptions:

- each woman can be modelled as a particle;
- the ropes are both light and inextensible;
- there is no air resistance to the motion;
- the motion is in a vertical line.

(a) Explain what it means when the women are each 'modelled as a particle'. **[1]**

(b) Explain what 'light' means in this context. **[1]**

The tension in the rope to the helicopter is 1500 N. The rescue worker has a mass of 65 kg and the rescued woman has a mass of 75 kg.

(c) Draw a diagram showing the forces on the two women. **[2]**

(d) Write down the equation of motion of the two women considered as a single particle. **[2]**

(e) Calculate the acceleration of the women. **[1]**

(f) Determine the tension in the rope connecting the two women. **[3]**