3 **(a)** **(i)** Explain what is meant by *work done*.

.....

..... [1]

(ii) Define *power*.

.....

..... [1]

(b) Fig. 3.1 shows part of a fairground ride with a carriage on rails.

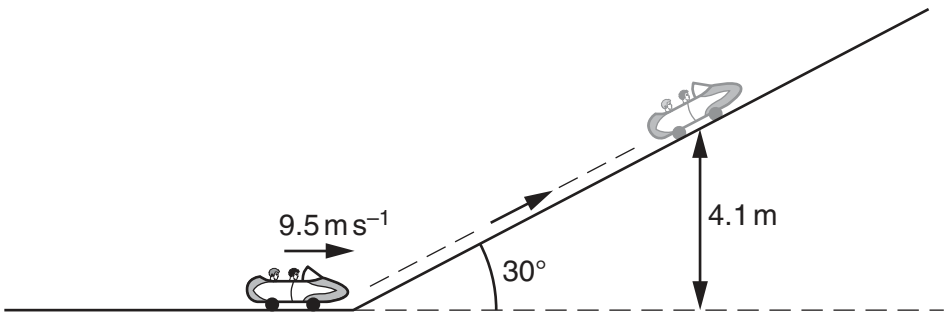

Fig. 3.1

The carriage and passengers have a total mass of 600 kg. The carriage is travelling at a speed of 9.5 m s^{-1} towards a slope inclined at 30° to the horizontal. The carriage comes to rest after travelling up the slope to a vertical height of 4.1 m.

(i) Calculate the kinetic energy, in kJ, of the carriage and passengers as they travel towards the slope.

kinetic energy = ... kJ [3]

(ii) Show that the gain in potential energy of the carriage and passengers is 24 kJ.

[2]

(iii) Calculate the work done against the resistive force as the carriage moves up the slope.

For Examiner's Use

work done = ... kJ [1]

(iv) Use your answer in **(iii)** to calculate the resistive force acting against the carriage as it moves up the slope.

resistive force = ... N [2]