3 A train ride for kids in an amusement park can vary between two power setting – *High* or *Low*. The power at *High* setting is double that of *Low*.

The total mass of the train and the passengers is 4000 kg. The frictional force acting on the train is constant at 700 N.

(a) When the train is travelling at 8.0 m s^{-1} and the power provided by the train is set to *High*, the train accelerates at 0.30 m s^{-2}.

Show that the power provided by the train is 15200 W.

[2]

(b) When the power provided by the train is set to *Low*,

(i) determine its maximum speed,

maximum speed = ... m s^{-1} [2]

(ii) determine the maximum speed when it is climbing up a slope that rises 1 m for every 25 m of road travelled.

maximum speed = ... m s^{-1} [3]

[Total: 7]

Question 4 begins over the page