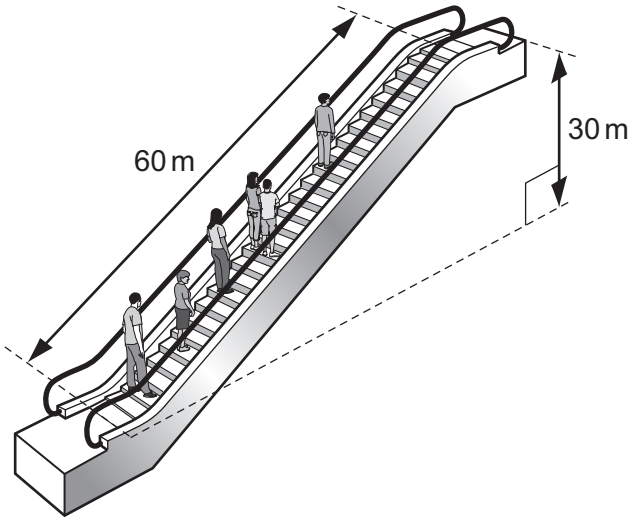
16 An escalator is 60 m long and lifts passengers through a vertical height of 30 m, as shown.



To drive the escalator against the forces of friction when there are no passengers requires a power of 2.0 kW.

The escalator is used by passengers of average mass 60 kg and the power to overcome friction remains constant.

How much power is required to drive the escalator when it is carrying 20 passengers and is travelling at 0.75 m s^{-1}?

A 4.4 kW **B** 6.4 kW **C** 8.8 kW **D** 10.8 kW

17 If the Universe was such that the speed of the molecules in a substance increased with temperature but at any particular temperature the speed of all the molecules in a substance was the same, which process would **not** occur?

A boiling

B condensation

C evaporation

D melting

Space for working