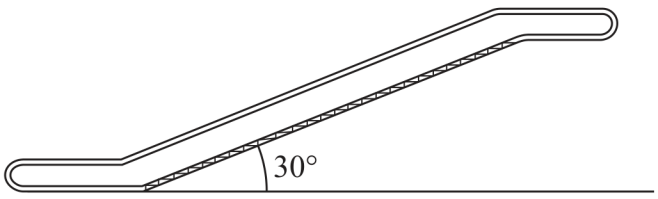
12 Moving walkways are often found in airports. One moving walkway carries passengers up an incline of 30°, as shown.

(Source: © ilolab/Shutterstock.)



(a) A single passenger of mass 72 kg stands on the walkway.
The speed of the walkway is 0.51 m s^{-1}.

Show that the rate at which the walkway does work on the passenger is about 200 W.

(3)

(b) The walkway system has an efficiency of 78%.

Calculate the power input to the system when 15 passengers of average mass 72 kg are standing on the walkway.

(3)

Power input = ...

(Total for Question 12 = 6 marks)

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