

13 A high-speed train accelerates from rest along a straight horizontal track.

(a) The final speed of the train is 76 m s^{-1} .

Show that the useful work done to accelerate the train is about 2 GJ.

mass of train = $7.2 \times 10^5 \text{ kg}$

(2)

(b) The train accelerates for 180 s. The train has an input power of 16 MW while accelerating.

Determine the work done against air resistance as the train accelerates.

(2)

Work done against air resistance =

(Total for Question 13 = 4 marks)