3. Two students observe a book of mass 0.2 kg fall vertically from rest from a shelf that is 1.5 m above the floor.

Student *A* suggests that the book is modelled as a particle falling freely under gravity.

(a) Use student *A*'s model to find the time taken for the book to reach the floor.

(3)

Student *B* suggests an improved model where the book is modelled as a particle experiencing a constant resistance to motion of magnitude *R* newtons.

Given that the time taken for the book to reach the floor is 0.6 seconds,

(b) use student *B*'s model to find the value of *R*

(5)

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Question 3 continued

(Total for Question 3 is 8 marks)

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