Leave blank

2. A truck of weight 9000 N is travelling up a hill on a straight road that is inclined at an angle θ to the horizontal, where $\sin\theta = \frac{1}{15}$

When the truck travels up the hill with the engine working at $3P$ watts, the truck is moving at a constant speed of $12\,\text{m s}^{-1}$

Later on, the truck travels down the hill along the same road, with the engine working at P watts. At the instant when the speed of the truck is $12\,\text{m s}^{-1}$, the acceleration of the truck is $\frac{g}{20}$

The resistance to motion of the truck from non-gravitational forces is a constant force of magnitude R newtons in all circumstances.

Find (i) the value of P,

(ii) the value of R.

(9)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Leave blank

Question 2 continued

Leave blank

Question 2 continued

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Leave blank

Question 2 continued

Q2

(Total 9 marks)