

8. A lorry is driven between London and Newcastle.

In a simple model, the cost of the journey £ $C$  when the lorry is driven at a steady speed of  $v$  kilometres per hour is

$$C = \frac{1500}{v} + \frac{2v}{11} + 60$$

(a) Find, according to this model,

(i) the value of  $v$  that minimises the cost of the journey,

(ii) the minimum cost of the journey.

*(Solutions based entirely on graphical or numerical methods are not acceptable.)*

(6)

(b) Prove by using  $\frac{d^2C}{dv^2}$  that the cost is minimised at the speed found in (a)(i).

(2)

(c) State one limitation of this model.

(1)