

**11.** A competitor is running a 24 kilometre race.

She runs each of the first 6 kilometres at a steady pace of 6.2 minutes per kilometre. After the first 6 kilometres, she begins to slow down.

In order to estimate her finishing time, the time that she will take to complete each subsequent kilometre is modelled to be 7% greater than the time that she took to complete the previous kilometre.

Using the model, find

- (a) the time to run the first 7 kilometres, **(2)**
- (b) an expression for her estimated time, in minutes, to run the  $r$ th kilometre, for  $7 \leq r \leq 24$  **(1)**
- (c) estimate the total time, in minutes and seconds, that she will take to complete the race. **(4)**

**(Total for Question 11 is 7 marks)**