Question 11 (Total 7 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$37.2 + (6.2 \times 1.07)$ minutes	M1	This mark is for a method to find the time taken for the competitor to run 7 km
	$= 43.83$ minutes $= 43$ minutes 56 seconds	A1	This mark is given for finding the total time as required
(b)	For example, 7th km $= 6.2 \times 1.07^1$ 8th km $= 6.2 \times 1.07^2$ 9th km $= 6.2 \times 1.07^3 \dots$ rth km $= 6.2 \times 1.07^{r-6}$	B1	This mark is given for showing the time taken to run the rth km, as required
(c)	$6(6.2) + \sum\limits_{7}^{24} 6.2 \times 1.07^{r-6}$	M1	This mark is given for showing the total time to run the race is the time taken for the first 6 km added to the time taken from 7th to 24th km
	$= 37.2 + 6.2 \times \dfrac{1.07(1.07^{18}-1)}{1.07-1}$ $= 37.2 + 6.2 \times 36.378\dots$	M1	This mark is given for using the sum of a geometric sequence formula and obtaining an expression for the total time
	$= 262.749\dots$ minutes	A1	This mark is given for a correct total time (represented decimally)
	$= 262$ minutes 45 seconds	A1	This mark is given for finding a correct total time given in minutes in seconds