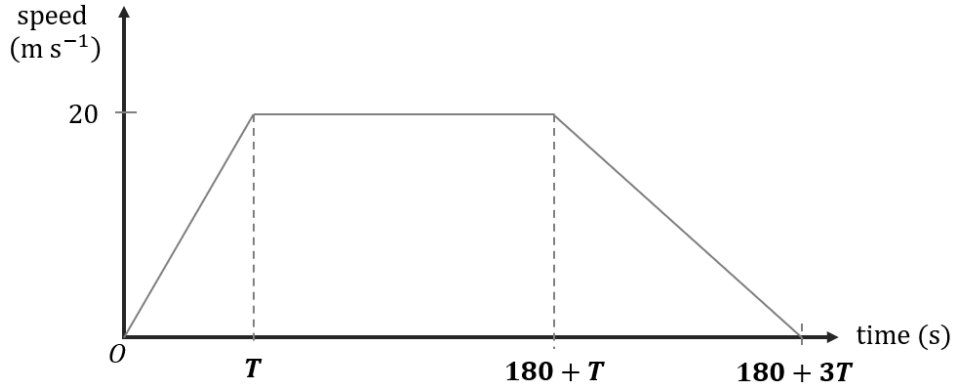
Question Number	Scheme	Marks
1(a)		B1 shape B1 20 B1 T, T+180, 3T+180
		(3)
1(b)	T and $2T$ seen or implied, for acceleration and deceleration in that order	B1
	Any of: $4800 = \left(\frac{20\times T}{2}\right) + (180\times 20) + \left(\frac{20\times 2T}{2}\right)$ $4800 = \left(\frac{20\times T}{2}\right) + \frac{1}{2}\times 20(180 + (180 + 2T))$ $4800 = \frac{1}{2}\times 20(180 + T + 180) + \left(\frac{20\times 2T}{2}\right)$ $4800 = \frac{1}{2}\times 20(180 + 3T + 180)$ $4800 = 20\times(180 + 3T) - \left(\frac{20\times T}{2}\right) - \left(\frac{20\times 2T}{2}\right)$	M1 A1 A1
	$T = 40$ (allow t)	A1
		(5)
1(c)	20 = a x their T oe	M1
	Acceleration = $\frac{1}{2}\left(\text{m s}^{-2}\right)$	A1 **ft**
		(2)
		(10)

NOTES

(a) **B1**	Correct shape with acceleration steeper than deceleration (**ignore** entries on the axes).
B1	Correct vertical label.
B1	Correct horizontal labels. Accept use of their T or appropriately labelled delineators.

(b)		
B1	Correct relationship seen or implied between the time accelerating and the time decelerating.	
M1	**A clear attempt** to use the total area under the graph (or use *suvat* formulae) and equate to 4800 (or 4.8) to form an equation in T only or their unknown only (e.g. replace T by $\frac{20}{a}$). Must involve a triangle or a trapezium (M0 if they use a *single suvat* formula for the whole motion)	
A1	An equation with at most one error. (use of 3 instead of 180 is one error) Having T and $2T$ round the wrong way, treat as one error	
A1	A fully correct equation	
A1	cao **N.B.** If attempting to use a single trapezium, and '180' appears in the bracket i.e. $\frac{1}{2}\times 20('T \text{ terms}' + 180)$, allow at least M1A1 for one correct parallel side. **N.B.** $\frac{1}{2}\times 20(x + 180) = 4800$ => $x = 300$ ONLY scores B0M1A1A0A0	
(c)		
M1	Correct equation in a, using their T	
A1 ft	Correct answer, follow through on their '40'	