Question	Answer	Marks	AO Element	Notes	Guidance
1	48 (m) (1) (6 + 18) × 4.0 **OR** $6 \times 4 + \frac{1}{2} \times 12 \times 4$ (1) distance = area under graph area = $\frac{1}{2}$ (sum of parallel sides) × base (1)	**3**			
2	16 (m / s) (1) 200 / 12.8 (1) (average speed =) (total) distance / (total) time in any form (1)	**3**			
3(a)	accelerating / increasing speed	**1**			
3(b)	50 (m / s)	**1**			
3(c)	C	**1**			
3(d)	150 (m) (1) 5 × 30 (1) (distance =) area under graph (1)	**3**			

Question	Answer	Marks	AO Element	Notes	Guidance
4	<u>speed</u> (of car) is steady **OR** <u>speed</u> is constant (1) (at) <u>16 m / s</u> (1)	2			
5(a)	260 (s)	1			
5(b)	1.9 (m / s) (1) 500 ÷ 260 **OR** 500 ÷ **(a)** (1) (speed =) distance ÷ time in any form (1)	3			
6	240 (m) (1) (distance =) ½ × 16 × 30 (1) distance travelled = area under graph **OR** (d =) speed × time **OR** ½ × b × h (1)	3			
7	(measurement) time **AND** (instrument used) stopwatch (1) (measurement) distance **AND** (instrument used) metre rule(r) (1)	2			

Question	Answer	Marks	AO Element	Notes	Guidance
8	graph starts at origin (1) speed = 0 at 9.0 s (1) highest speed at 17 s (1)	3			
9	(car) A (has greater acceleration) (1) (speed-time graph / line) has greater gradient **OR** is steeper (1)	2			
10	9.3 (m / s) (1) any indication on graph or in working of vertical line from 10.0 s (1)	2			
11	50 (cm) (1) ½ × 4 × 25 (1) (distance =) area under graph **OR** (distance =) speed × time (1)	3			
12	9.7 s (1) (a =) Δ v ÷ t in any form **OR** 28 (−0) / 2.9 (1)	2			

Question	Answer	Marks	AO Element	Notes	Guidance
13(a)	($\Delta v =$) 4.0×0.80 (= $3.2\,m/s$) (1) (Δ)$v = at$ in any form (1)	2			
13(b)	($t = 0.020/3.2 =$) $0.0063\,s$ **OR** $6.3 \times 10^{-3}\,s$ (1) ($t =$) d / v in any form (1)	2			
14	air resistance/resultant/resistive force decreases **AND** as speed decreases/car decelerates (1) air resistance/resultant/resistive force decreases/changes (1)	2			
15	negative acceleration **OR** decrease in velocity (1) <u>change</u> in velocity per unit time **OR** rate of <u>change</u> of velocity (1)	2			
16	delay in applying brakes **OR** (human) reaction time **OR** foot not removed from accelerator	1			
					[Total: 44]