

Question number	Answer	Notes	Marks
7 (a)	substitution into $F = (mv - mu) / t$ ; rearrangement; evaluation;  e.g. $2.5 = [0.074 \times 3.0 - (-0.074 \times 0.0)] / \text{time}$ $\text{time} = (0.074 \times 3.0) / 2.5$ $(\text{time} =) 0.089 \text{ (s)}$	0.08 scores 2 marks if supported by valid working allow alternative method using $F=ma$ and $a=(v-u)/t$  allow 0.09, 0.0888 (s) condone 0.088 (s)	3
(b)	magnitude = 4.9 (N); direction = right/opposite to car;	ignore East	2
(c)	any two from: MP1. (crumple zone) increases the time (taken to stop); MP2. same momentum change (as car 2);  MP3. smaller acceleration; MP4. reference to formula force = change in momentum/time;	allow same velocity change (as car 2) allow deceleration	2

Total for Question 7 = 7 marks