

Question number	Answer	Notes	Marks
9 (a) (i)	recall of (unbalanced) force = mass × acceleration; substitution and rearrangement; evaluation to 2 s.f. or more; e.g. $F = m \times a$ $a = 41000 / 830$ $a = 49 \text{ (m/s}^2\text{)}$	allow symbols can be implied from valid substitution of data allow 49.39...	3
(ii)	substitution into $v^2 = u^2 + 2as$; rearrangement; evaluation; e.g. $26^2 = 72^2 + 2 \times (-50) \times s$ (distance =) $5184 - 676 / 100$ (distance =) 45 (m)	allow ecf from (i) expect answers in range 45-46 (m) reject $72 - 26 = 46$ (wrong physics) accept 46 if unqualified	3
(b)	kinetic energy (store) of car decreases; thermal energy (store) of brake(s) increases; energy transferred mechanically;	kinetic energy/ KE of car transforms to {heat/thermal} energy of brakes due to work done by {friction / brakes} NB only award from either the answer column or notes column, not from a mix of the two.	3
(c)	any two from: MP1. idea that insulating materials are poor conductors; MP2. layers trap air; MP3. air itself is a poor conductor/(good) insulator MP4. (energy transfer due to / rate of) conduction reduces; MP5. idea increased thickness reduces (rate of) conduction	condone idea of stopping conduction	2

Total for Question 9 = 11 marks