

9	(a)		$0.3 = \frac{1}{2}a \times 0.4^2 (\Rightarrow a = 3.75)$ $0.5g \sin \theta - T = 0.5a$ $0.5g \times \frac{3}{5} - T = 0.5 \times 3.75$ $T = 1.065 \text{ N}$	B1 M1 A1ft A1 [4]	3.1b Cao seen or implied by correct T 3.3 Use of N II parallel to the plane (correct number of terms) – weight must be resolved (but allow sin/cos confusion in component of the weight – may still be in terms of θ and a (or their incorrect values of θ and a)) 1.1 ‘correct’ equation in terms of T with their a Allow $0.5g \times \sin 36.9 - T = 0.5 \times '3.75'$ or $0.5g \times \sin 0.644 - T = 0.5 \times '3.75'$ (in radians) 1.1 Allow 1.07 www	Allow sign errors but M0 if using 0.5g for the mass on the rhs or if only resolving the mass (e.g. $0.5 \sin \theta$) on the lhs A0 if $a = 0$ or $\pm g$ (or a component of g)
9	(b)		$R = 0.2g$ $T - F = 0.2a$ or $T - \mu R = 0.2a$ $1.065 - F = 0.2(3.75)$ $0.315 = \mu \times 0.2 \times 9.8$ $\mu = 0.161$	B1 M1* A1 M1dep* A1 [5]	1.1 Where R is the normal contact force of surface acting on B – may be implied in N II applied horizontally 3.3 Use of N II horizontally for B or $0.5g \sin \theta - F = 0.7a$ for the whole system (M0 if any other mass used for whole system) 1.1 Or for a correct statement without explicitly seeing F e.g. $1.065 - 0.2g\mu = 0.2(3.75)$ (which would imply the next M mark as well) 3.4 Use of $F = \mu R$ where $R = 0.2g$ - may be implied in N II applied horizontally 1.1 Allow awrt 0.161 or 0.163 from using $T = 1.07$ www	Correct number of terms (M0 if mass is 0.2g) – allow sign errors $F = 0.315$ or $\mu R = 0.315$ or $F = 0.32$ $\mu = \frac{9}{56}$