

Spec Ref	Topic	TAP Ref	comment
3.4.1 A	gravity & weight, gravitational field strength	402	
	$ma = R \pm mg$, in lift	212-2	
	Stokes' law (at terminal velocity only) $mg = 6\pi\eta avt$	209	Equation not quoted
	Newton's gravitational law	401	
	variation of g above the Earth's surface	404	
	Angular velocity, centripetal force	225	
	reaction and weight, weightlessness	403	
B	field lines and equipotential surfaces	402, 404	
	gravitational potential energy	404	
	energy transfers involved during launch and return		
	energy needed to escape from the Earth	404-2, 404-3	Principles used in questions
C	forces acting on rockets compared with forces on aeroplanes		
	momentum = mv , Newton's third law	212	
	conservation of linear momentum	220	
	the rocket equation $v_f = v_e \ln(m_0 / m_f)$		
	payload: fuel ratio		
	how thrust is produced, rocket fuels & gas expansion	222-4	In some questions
	ideal gas equation, pressure = F/A	602	
	first law of thermodynamics Work done = $p \Delta V$	605	
3.4.2 A	simple harmonic motion	300, 301	
	maximum speed = $2\pi fA$	302	
	mass-spring system with $T = 2\pi \sqrt{k/m}$, simple pendulum with $T = 2\pi \sqrt{l/g}$	303, 304	
	maximum and minimum KE & PE	305	
	damping and resonance	306, 307	
B	$F = m\omega^2 r$ or mv^2 / r	225	
C	angular momentum & KE = $\frac{1}{2} I\omega^2$		
	torque and angular momentum		
	moment of inertia $I = T/\alpha$, angular acceleration $\alpha = \omega/\Delta t$		
	conservation of angular momentum		
	equations of motion for angular acceleration		