A Level & Further Maths Topics by Exam Board - Mechanics (8 pages; 9/7/21)

A Level

M: material common to AS and AL

M*: material for 2nd year of AL only

Further Maths

OCR

M: material common to AS and AL

M*: material for 2nd year of AL only

OCR B (MEI)

Mechanics a [Ma] ('minor'; 1st half of 'major') [can be taken at either AS and AL]

Mechanics b [Mb] (2nd half of 'major') [can be taken at either AS and AL]

AQA

M: material common to AS and AL

M*: material for 2nd year of AL only

Note: AQA specifications don't give any guidance, but there are useful notes for OCR, MEI & EDX, which can sometimes be referred to.

EDX

M1: material common to AS

M1*: material for 2nd year of AL only

M2: material common to AS

M2*: material for 2nd year of AL only

	fmng reference (Y⇒ note exists)	**OCR**	**OCR B (MEI)**	**AQA**	**EDX**
Introduction					
terminology associated with simplifying assumptions			M		
SI units		M	M	M	M
derived quantities		M	M	M	M
particle model		M	M		
Centre of Mass	Y				
Introduction		M*	Ma	M	M2
Triangular lamina			Ma		
Composite plane figure		M*	Ma	M	M2
Composite rigid body		M*	Ma	M	M2*
Use of integration					
- lamina		M*	Mb	M*	M2*
- solid of revolution		M*	Mb	M*	
- non-uniform body					M2*
Suspension from point		M*	Ma	M*	M2*
Toppling / sliding		M*	Ma	M*	M2*

Circular Motion					
Uniform circular motion	Y				
Introduction		M	Mb	M	M2
Conical pendulum		M	Mb	M*	M2
Banked track		M	Mb		M2
Motion in a vertical circle	Y				
Use of energy methods		M	Mb	M*	M2*
Use of components of acceleration		M*	Mb	M*	M2*
Motion involving freefall		M*	Mb		
Differential Equations					
SHM	DE: Oscillations	see Pure	see Pure	see Pure	M2*
Dimensional analysis		M	Ma	M	M
Energy, Work & Power					
Energy					
KE & PE	Energy	M		M	M1
use of scalar product		M*			
Work					
Introduction		M	Ma	M	M1

2D force		M*			
Variable force		M*		M	
Hooke's law	Y				
Introduction		M*	Mb	M	M1*
Elastic PE		M*	Mb	M	M1*
Conservation of energy	Energy				
Introduction		M	Ma	M	M1
Work-energy principle		M	Ma		M1
Power					
Average power		M	Ma		
$P = Fv$		M	Ma	M	M1
Variable resistance					M1
use of scalar product		M*			
Forces					
Force diagrams		M	M	assumed	assumed
Newton's 1st law		M	M	M	M
Newton's 2nd law		M	M	M	M
Situations where forces need to be resolved		M*	assumed	M*	M*
Gravity & weight		M	M	M	M
Newton's 3rd law		M	M	M	M

connected particles		M	M	M	M
smooth pulleys		M	M	M	M
Use of polygon of forces		M	M		
Resultants of forces		M*	M,M*	M*	M*
Equilibrium of particle		M	M, M*, Ma	M	M
Equilibrium of rigid body in plane (moments)		M*,M*	M*,Ma	M*,M*	M*,M2
Friction	Y				
Introduction		M			
components of contact force: normal & friction		M*	M*	M*	
Coeff. of friction		M*	M*,Ma	M*	M*
Vectors			Ma		
Impulse & Momentum	Y				
Impulse-momentum eq'n & conservation of momentum - 1D		M	Ma	M	M1
Impulse-momentum eq'n & conservation of momentum - 2D		M*		M	M1*
Impulse-momentum eq'n, with variable force (1D)		M*		M	

Direct impact of spheres (incl. coeff. of rest.)		M	Ma	M	M1
Impact of sphere on level plane		M	Ma	M	M1
Oblique impact of sphere on plane	Oblique impact with plane	M*	Mb	M?	M1*
Oblique impact of spheres	Oblique impacts	M*	Mb		M1*
Kinematics					
terminology		M	M	M	M
displacement-time graphs		M	M	M	M
velocity-time graphs		M	M	M	M
accel-time graphs			M		
suvat eq'ns		M	M	M	M
- derivation: (i) integration (ii) graphs (iii) other suvat eq'ns		M	M	M	M
2D vector form of suvat eq'ns		M*	M*	M*	M*
Use of calculus	Y	M	M,Mb	M	M,M2
- using 2D vectors		M*	M*	M*	M*

Finding cartesian eq'n of path from vector components of position			M*		
Velocity vector giving direction of motion		M*	M*		
Projectiles	Y	M*	M*,Mb	M*	M*