

1) Convert the following into the units stated.

i) 340 km/h to m/s

ii) 12 m/s to km/h

[7]

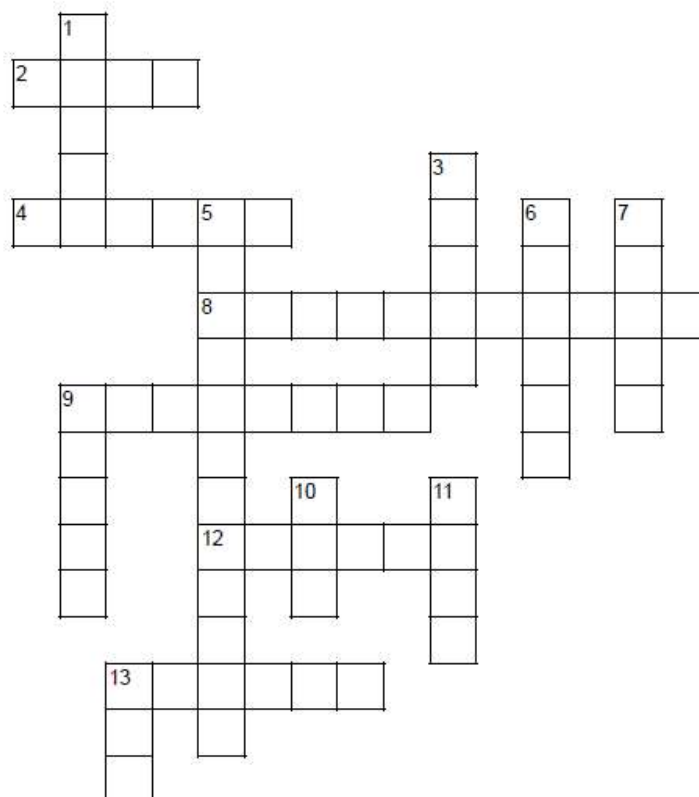
iii) 19.3 g/cm³ to kg/m³

iv) 929 kg/m³ to gm⁻³

v) 0.9gcm⁻³ to kgm⁻³

vi) 5.24 g/cm³ to kg/L

A-level Maths. Mechanics, Modelling Assumptions

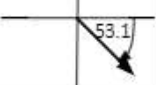


Across

- 2 a thin, inextensible, rigid, light body
- 4 the body is not moving
- 8 there is no resultant force acting on the body
- 9 a body whose mass acts at a point, so dimensions do not matter
- 12 a body in contact with the surface will not experience a frictional force
- 13 a wheel, usually modelled as fixed and smooth, over which a string passes.

Down

- 1 the body has negligible mass
- 3 the body does not bend
- 5 the body cant be stretched
- 6 a thin body, usually modelled as being light and inextensible
- 7 a body in contact with the surface will experience a frictional force which will oppose the motion
- 9 a flat surface
- 10 a long, thin, straight, rigid body
- 11 the body has negligible thickness
- 13 a fixed support which a body can hang from or rest on.

Vector	Magnitude	Direction Anticlockwise from the i direction unless stated otherwise	Written in terms of \underline{a}	Diagram
$3i + 4j$			\underline{a}	
$6i + 8j$				
	20	53.1°		
			$6\underline{a}$	
	1	53.1°		
	5	On a bearing of 216.9°		
	2.5			

Have a go at:

A particle is initially travelling with velocity $(4i + 5j) \text{ ms}^{-1}$. It undergoes an acceleration of magnitude 2.5 ms^{-2} in a direction given by the vector $(3i - 4j)$. Find the velocity and displacement of the particle from its initial position after 4 seconds.