

# Answers to Mechanics 1 “Mock” paper

(Numerical answers exact or to 3sf unless stated)

- 1 a)  $3 \text{ ms}^{-2}$  b) 6 s c)  $v = 26.6 \text{ ms}^{-1}$  (3sf)
- 2 a)  $\Theta = 14.5^{\circ}$  (3sf) b)  $T = 6.99 \text{ N}$
- 3 a) (sketch) b)  $V = 55$  c)  $7.5 \text{ ms}^{-2}$
- 4 a)  $M = 10 \text{ kg}$  b)  $x = 2.4 \text{ m}$   
c) (i) weight acts at center (ii) plank remains straight  
(iii) weights act at ends of plank
- 5 a)  $V = 5.6 \text{ ms}^{-1}$  b)  $v = 5.2 \text{ ms}^{-1}$  c)  $F = 8103.2 \text{ N}$   
d)  $s = 0.14 \text{ m}$  (2dp)
- 6 a) (show collision) b)  $AB = (8-3t)\mathbf{i} = (-6+4t)\mathbf{j}$   
c) 2.83 km d) time 1440
- 7 a)  $a = 4.5 \text{ ms}^{-2}$  b) show weight component  $> F_{\max}$   
c)  $1.5 \text{ ms}^{-2}$