

Horizontal Motion - Edexcel Past Exam Questions MARK SCHEME

Question 1 Nov 04 Q6

Question Number	Scheme	Marks
(a)	$v^2 = 20^2 + 2 \times 4 \times 78 \Rightarrow v = \underline{32 \text{ m s}^{-1}}$	M1 A1 (2)
(b)	<i>B:</i> $32 = 20 + 4t \Rightarrow t = 3 \text{ s}$ <i>A:</i> $\text{Distance} = 30 \times t = \underline{90 \text{ m}}$	M1 A1√ ↓ M1 A1 (4)
(c)	$30T = 20T + \frac{1}{2} \cdot 4 \cdot T^2$ $2T^2 - 10T = 0$ $\Rightarrow t = (0 \text{ or}) \underline{5 \text{ s}}$	M1 ↓ M1 A1 ↓ M1 A1 (5)

Question 2 Jan 05 Q6

Question Number	Scheme	Marks
-	(a) $16^2 = 20^2 - 2 \times a \times 24 \Rightarrow a = \underline{3 \text{ m s}^{-2}}$	M1 A1 (2)
	(b) $v^2 = 20^2 - 2 \times 3 \times 30$ $v = \underline{\sqrt{220} \text{ or } 14.8 \text{ m s}^{-1}}$	M1 A1√ A1 (3)
	(c) $0.3 = m \times 3 \Rightarrow m = 0.1 \text{ kg}$ (*)	M1 A1 (2)
	(d) $0.1(w + \sqrt{220}) = 2.4$ $w = 9.17$ $0 = 9.17 - 3 \times t$ $t \approx \underline{3.06 \text{ s}}$	M1 A1√ A1 ↓ M1 A1√ A1 (6)



Question 3 June 05 Q1

Question Number	Scheme	Marks
	<p>(a) '$v = u + at$': $74 = 2 + a \times 20 \Rightarrow a = \underline{3.6 \text{ m s}^{-2}}$</p> <p>(b) '$v^2 = u^2 + 2as$': $74^2 = 2^2 + 2 \times 3.6 \times AC$</p> <p>or '$s = ut + \frac{1}{2}at^2$': $AC = 2 \times 20 + \frac{1}{2} \times 3.6 \times 20^2$</p> <p style="padding-left: 40px;">$\Rightarrow AC = 760 \text{ m}$</p> <p style="padding-left: 40px;">Hence $BC = 1200 - 760 = \underline{440 \text{ m}}$</p>	<p>M1 A1 (2)</p> <p>M1 A1√</p> <p>A1</p> <p>B1√ (4)</p>



Question 4 June 06 Q3

Question Number	Scheme	Marks
1	<p>(a) $AB: 50 = 2 \times 22.5 + \frac{1}{2} a \cdot 4$ $\Rightarrow a = \underline{2.5 \text{ m s}^{-2}}$</p> <p>(b) $v^2 = 22.5^2 + 2 \times 2.5 \times 100$ $\Rightarrow v \approx \underline{31.7(2) \text{ m s}^{-1}}$</p> <p>(c) $v_B = 22.5 + 2 \times 2.5 = 27.5$ (must be used) $31.72 = 27.5 + 2.5t$ OR $50 = 27.5t + \frac{1}{2} \times 2.5t^2$ OR $50 = \frac{1}{2} (27.5 + 31.72)t$ $\Rightarrow t \approx \underline{1.69 \text{ s}}$</p> <p>OR $31.72 = 22.5 + 2.5T$ OR $100 = 22.5t + \frac{1}{2} \times 2.5T^2$ $\Rightarrow T \approx 3.69$ $\Rightarrow t \approx 3.69 - 2 = \underline{1.69 \text{ s}}$</p> <p>OR $50 = 31.7t - \frac{1}{2} \times 2.5t^2$ Solve quadratic to get $t = \underline{1.69 \text{ s}}$</p>	<p>M1 A1 A1 (3) M1 A1√ A1 (3) M1 ↓ M1 A1√ A1 (4) M1 A1√ ↓ M1 A1 (4) M2 A1√ A1 (4)</p>
	<p>NB note slight changes to scheme: dependency now in (c) and new rule on accuracy of answers.</p> <p>(b) M1 for valid use of data (e.g. finding speed at <i>B</i> by spurious means and using this to get <i>v</i> at <i>C</i> is M0. Accept answer as AWR 31.7</p> <p>In (b) and (c), f.t. A marks are for f.t. on wrong <i>a</i> and/or answer from (b).</p> <p>(c) M1 + M1 to get to an equation in the required <i>t</i> (normally two stages, but they can do it in one via 3rd alternative above) Ans is cao. Hence premature approx (\rightarrow e.g. 1.68) is A0. But if they use a 3 sf answer from (b) and then give answer to (c) as 1.7, allow full marks. And accept 2 or 3 s.f. answer or better to (c).</p>	



Question 5 June 09 Q1

Question Number	Scheme	Marks
	$45 = 2u + \frac{1}{2}a2^2 \Rightarrow 45 = 2u + 2a$ $165 = 6u + \frac{1}{2}a6^2 \Rightarrow 165 = 6u + 18a$ <p style="text-align: center;">eliminating either u or a</p> $u = 20 \text{ and } a = 2.5$	M1 A1 M1 A1 M1 A1 A1 [7]