GCE A LEVEL MARKING SCHEME

SUMMER 2025

A LEVEL
MATHEMATICS
UNIT 4 APPLIED MATHEMATICS B
1300U40-1

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

WJEC GCE A LEVEL MATHEMATICS

UNIT 4 APPLIED MATHEMATICS B

SUMMER 2025 MARK SCHEME

SECTION A – Statistics

Q1	Solution	Mark	Notes
	$\frac{c+d}{2} = 7.5$	B1	oe e.g. $c + d = 15$ $c = 15 - d$ $d = 15 - c$
	$\frac{(d-c)^2}{12} = 3$	B1	oe e.g. $(d-c)^2 = 36$ $d - c = (\pm)6$ Condone a and b here.
	Solve simultaneously $c + d = 15$ $d - c = 6$	M1	Must have at least one B1. Attempt to solve. Allow 1 slip. This could be substituting one eqn into the other. e.g. $\frac{(d-(15-d))^2}{12} = 3$ e.g. $15 = c + (6 + c)$ $15 = 2c + 6$ Condone a and b here.
	$c = 4.5, d = 10.5$	A1 **[4]**	M1A0 for $c = 10.5, d = 4.5$ cao Both. Must be c and d.
	Total for Question 1	**4**	

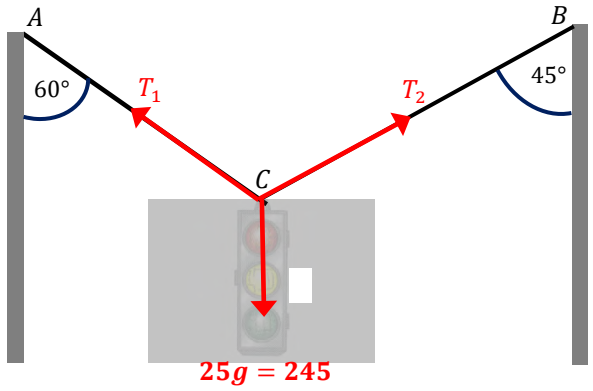
Q2	Solution	Mark	Notes
(a) (i)	$\mathrm{P}(C) = 0.2 \times 0.9 + 0.5 \times 0.7 + 0.3 \times 0.25$ $= 0.18 + 0.35 + 0.075$ $= 0.605 \left(\text{OR } \frac{121}{200}\right)$ OR $\mathrm{P}(C) = 1 - \mathrm{P}(I)$ $= 1 - (0.2 \times 0.1 + 0.5 \times 0.3 + 0.3 \times 0.75)$ $= 1 - (0.02 + 0.15 + 0.225)$ $= 1 - 0.395$ $= 0.605$	M1A1 A1 (M1) (A1) (A1) **[3]**	M1 for sight of at least four correct values within addition formula. A1 for fully correct method. $1 - \mathrm{P}(I)$ needed for M1 and A1 Sight of at least four correct values within addition formula for M1
(a) (ii)	$\mathrm{P}(N\|C) = \frac{\mathrm{P}(N \cap C)}{\mathrm{P}(C)}$ $= \frac{0.3 \times 0.25}{0.605}$ $= 0.1240 \text{ OR } \frac{15}{121}$	 M1 A1 **[2]**	FT their denominator from (a) provided $0 < \mathrm{P}(C) < 1$ and answer is valid probability for possible M1A1 FT their $\mathrm{P}(N \cap C)$ from (a) for M1 only *3sf or greater required*
(b) (i)	$\mathrm{P}(\text{correct}) = p \times 1 + (1-p) \times \frac{1}{4}$ $p \times 1 + (1-p) \times \frac{1}{4} \geq 0.7$ $\frac{1+3p}{4} \geq 0.7$ Least value is $p = 0.6$	M1 m1 A1 A1 **[4]**	M1 for attempt at expression for $\mathrm{P}(\text{correct})$. Must have either $p + \cdots$ or $(1-p) \times \frac{1}{4}$. oe For forming an equation or inequality using their expression for $\mathrm{P}(\text{correct})$ and 0.7 Fully correct method. cao Accept $p \geq 0.6$ Condone use of $\geq$ or $=$ throughout.
(b) (ii)	Let X be the number of correct answers. $X \sim \mathrm{B}(10, 0.7)$ $\mathrm{P}(X \geq 8) = 1 - \mathrm{P}(X \leq 7)$ = 1 – 0.61721… $= 0.3828$	B1 M1 A1 **[3]**	si May be by a correct method. Written or used. oe method. $\mathrm{P}(X = 8)$ scores M0 cao 3 sf or better.
	Total for Question 2	**12**	

Q3	Solution	Mark	Notes
(a)	Valid explanation e.g. The councillor is concerned about the decline of bus drivers being linked with an increase of delivery company drivers.	E1 **[1]**	For E1 must address decrease in bus drivers and increase in delivery drivers. Accept E1 Specifically looking for negative correlation. E1 Likely to be negative correlation. E0 Graph shows negative correlation. E0 Claim only talks about the decline, a negative statement. If it was research about positive or negative it would be 2-tailed. E0 Councillor is concerned about the decline of bus drivers.
(b)	$H_0: \rho = 0 \qquad H_1: \rho < 0$ $\text{TS} = -0.8206$ $\text{CV} = (\pm)0.6215$ Since $\lvert\text{TS}\rvert > 0.6215$ (or $-0.8206 < -0.6215$), there is sufficient evidence to reject H_0. There is evidence to suggest that there is **negative** correlation between the number of delivery drivers and the number of bus drivers.	B1 B1 B1 B1 E1 **[5]**	B0 for H_0: correlation = 0. Population must be stated or implied. B0 for omission of ρ or use of r. B0 for non-strict inequality. B1 Labelled as test statistic or used in comparison with a critical value (not a significance level). If positive, only award once compared with 0.6215. Must account for $-$ at some point. e.g. $-0.8206 < 0.6215$ is B0 FT their CV. Comparison may be implied by a diagram. cso Must have context.
(c) (i)	Valid reason. e.g. There is only a limited number of drivers so a delivery company could offer more money to a driver and then that would lead to a decrease in bus drivers. e.g. Bus driver is becoming a less attractive job and delivery driver is becoming a more attractive job. e.g. Conditions of work may be better as a delivery driver compared to those of a bus driver.	E1	E1 Better job/pay/hours as a delivery driver. E0 Number of bus drivers and delivery drivers are connected. E0 for stating there is a causal link because bus drivers are becoming delivery drivers.
(ii)	Valid reason. e.g. The city councillor cannot reach any conclusion because she does not have any data over time. She only has a snapshot at one point in time for 8 cities.	E1 **[2]**	
	Total for Question 3	**8**	

Q4	Solution	Mark	Notes
(a)	$\mathrm{P}(X < 28) = 0.1587$	M1 A1 **[2]**	M1 for lower:-99999 (say) upper: 28 σ: 0.3 μ: 28.3 A1 3sf or better.
(b)	$\mathrm{P}(X > 28.8) = 0.04779$ $\mathrm{P}(X > 29.1) = 0.00383$	M1 A1 M1 (A1)	M1 for lower:28.8 upper: 999999 (say) σ: 0.3 μ: 28.3 M1 for lower:29.1 upper: 999999 (say) σ: 0.3 μ: 28.3 A1 if not previously awarded.
	$\mathrm{P}(X > 29.1 \mid \text{heavy}) = \frac{\mathrm{P}(X>29.1)}{\mathrm{P}(\text{heavy})}$ $\mathrm{P}(X > 29.1 \mid \text{heavy}) = \frac{0.00383}{0.04779}$ $= 0.0801$	M1 m1 A1 **[6]**	Recognising conditional probability leading to fraction <1. Correct fraction. FT “Their 0.04779” and “0.00379” cao awrt 0.08
(c) (i)	Valid comment. e.g. The histogram looks like it could be approximated by a normal curve.	E1 **[1]**	Condone ‘resembles bell shaped curve’ Condone ‘unimodal and symmetrical’ Don’t allow ‘symmetrical’ on its own. Recognising and stating normal distribution is enough for E1

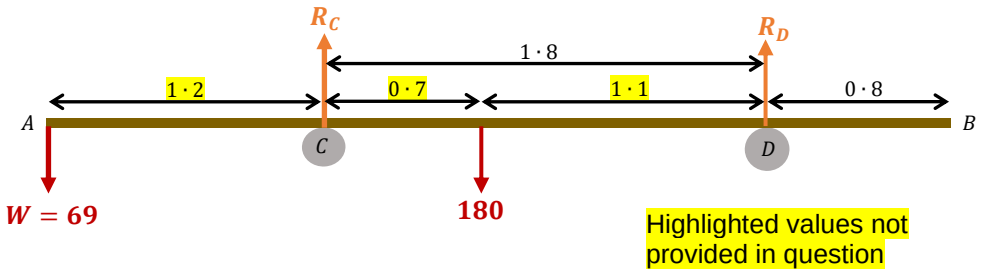
(c) (ii)	(Let μ be the mean mass of a pack of cards in g) $H_0: \mu = 28.3$ $H_1: \mu > 28.3$	B1	Must be μ.
	$\bar{X} \sim \mathrm{N}\left(28.3, \frac{0.32^2}{10}\right)$ under H_0	B1	Distribution of $\bar{X}$ si.
	Use of $\bar{x} = \frac{285}{10} = 28.5$	B1	B1 for appropriate **use** of 28.5, not just calculating.
	METHOD 1 (*p*-value) $\mathrm{P}(\bar{X} > 28.5 \mid H_0)$	M1	Must use $\sigma_{\bar{X}} = 0.32/\sqrt{10}$ $(0.10119\ldots)$ for M1. M1 for a clear attempt to find $\mathrm{P}(\bar{X} > 28.5)$ e.g. calculator inputs. M1 for $\mathrm{P}\left(Z > \frac{28.5-28.3}{\frac{0.32}{\sqrt{10}}}\right) = \mathrm{P}(Z > 1.98)$
	$= 0.02405$	A1	
	Since $0.02405 < 0.03$ there is sufficient evidence to reject H_0.	m1	Dep on previous M1. FT their hypotheses.
	METHOD 2 (Critical value) CV = 28.49 (CR is $\bar{X} > 28.49$)	(M1A1)	M1 implied by correct answer from calculator or for correctly standardising and equating to 1.881: $\frac{CV-28.3}{\frac{0.32}{\sqrt{10}}} = 1.881$. Must use $\sigma_{\bar{X}} = 0.32/\sqrt{10}$ $(0.10119\ldots)$ for M1. Dep on previous M1. FT their hypotheses.
	Since $28.5 > 28.49$ there is sufficient evidence to reject H_0.	(m1)	
	METHOD 3 (critical value with standardising): $\mathrm{TS} = \frac{28.5-28.3}{\frac{0.32}{\sqrt{10}}}$	(M1)	Must use $\sigma_{\bar{X}} = 0.32/\sqrt{10}$ $(0.10119\ldots)$ for M1. 1.976 earns M1A1 if used as a TS. Dependent on previous M1. FT their TS and hypotheses. Correct comparison with 1.881 required.
	$= 1.976$	(A1)	
	Since $1.976 > 1.881$ there is sufficient evidence to reject H_0.	(m1)	
	There is sufficient evidence to suggest that the packs Graham has to sell are on average heavier than 28.3g	A1	cso Do not allow categorical statements
		[7]	
	Total for Question 4	**16**	

SECTION B – Differential Equations and Mechanics

Q5	Solution	Mark	Notes
(a)			
	Attempt to resolve horizontally **AND** vertically (only 1 needs to be dim. correct, i.e. allow missing g) Horizontally (↔) $T_1 \sin 60° = T_2 \sin 45°$ $\left(\frac{\sqrt{3}}{2}T_1 = \frac{\sqrt{2}}{2}T_2\right)$ $T_1 = \frac{\sin 45°}{\sin 60°}T_2 = \frac{\sqrt{6}}{3}T_2$ or $T_2 = \frac{\sin 60°}{\sin 45°}T_1 = \frac{\sqrt{6}}{2}T_1$ $T_1 \approx 0 \cdot 816 \ldots T_2$ or $T_2 \approx 1 \cdot 224 \ldots T_1$ Vertically (↕) $T_1 \cos 60° + T_2 \cos 45° = 25g \quad (= 245)$ $\frac{1}{2}T_1 + \frac{\sqrt{2}}{2}T_2 = 25g \quad (= 245)$ Attempt to eliminate one variable $\frac{1}{2}\left(\frac{\sqrt{6}}{3}T_2\right) + \frac{\sqrt{2}}{2}T_2 = 25g$ or $\frac{1}{2}T_1 + \frac{\sqrt{2}}{2}\left(\frac{\sqrt{6}}{2}T_1\right) = 25g$ $T_1 = 179 \cdot 352 \ldots \approx 179$ (N) $T_2 = 219 \cdot 660 \ldots \approx 220$ (N) $T_1 = 179 \Rightarrow T_2 = 219 \cdot 229 \ldots \approx 219$ (N)	M1 B1 A1 m1 A1 A1 **[6]**	No missing/extra forces, correct signs allow for confusion of sin/cos with 60 and 30 First correct equation, oe $T_1 \cos 30° = T_2 \cos 45°$ $T_1 \cos 30° = T_2 \sin 45°$ $T_1 \sin 60° = T_2 \cos 45°$ Second correct equation, oe $T_1 \sin 30° + T_2 \sin 45° = 25g$ $T_1 \sin 30° + T_2 \cos 45° = 25g$ $T_1 \cos 60° + T_2 \sin 45° = 25g$ Any valid method Convincing cao, any form.

Q5	Solution	Mark	Notes
(b)	A sensible modelling assumption. For example; • Cables are modelled as **light** strings. • Cables have negligible mass.	B1 **[1]**	Do not accept • Cables are inextensible • Lights modelled as a particle • Lights are uniform
	Total for Question 5	**7**	

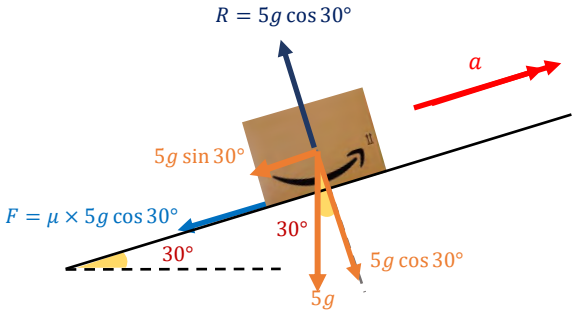
Further Notes	
(a)	**Exact forms** for the tension in AC and BC $T_1 = \frac{100g}{2+2\sqrt{3}} = \frac{980}{2+2\sqrt{3}} = \frac{490}{1+\sqrt{3}} = 25g\left(\sqrt{3}-1\right) = 245\left(\sqrt{3}-1\right) = 179\cdot 352\ldots \approx 179$ (N) $T_2 = \frac{150g}{\sqrt{6}+3\sqrt{2}} = \frac{1470}{\sqrt{6}+3\sqrt{2}} = \frac{25}{2}g\left(3\sqrt{2}-\sqrt{6}\right) = \frac{245}{2}\left(3\sqrt{2}-\sqrt{6}\right) = 219\cdot 660\ldots \approx 220$ (N)

Q6	Solution	Mark	Notes
(a)	 Highlighted values not provided in question		
	Moments about C If moments are listed separately, then they must be part of an equation for M1 $R_D \times 1 \cdot 8 + W \times 1 \cdot 2 = 180 \times 0 \cdot 7$ $R_D \times 1 \cdot 8 + 69 \times 1 \cdot 2 = 180 \times 0 \cdot 7$ $1 \cdot 8R_D + 82 \cdot 8 = 126$ $R_D = 24$ (N) Resolve vertically $R_C + R_D = 180 + W$ $R_C + R_D = 180 + 69$ $R_C + R_D = 249$ $R_C + (24) = 249$ $R_C = 225$ (N)	M1 A1 A1 M1 A1 A1 **[6]**	Dim. correct **equation**, oe, no extra/missing forces Allow incorrect signs/distances Correct **equation** (with or without W) cao Dim. correct equation, oe, $\pm$ no extra/missing forces (or 2nd moment equation) Correct equation (with or without W) cao
(b)	For maximum W, rod will be on the point of turning about C, $R_D = 0$ $(\Rightarrow R_C = 285)$ Moments about C $180 \times 0 \cdot 7 = W \times 1 \cdot 2$ $126 = 1 \cdot 2W$ $W = 105$	M1 m1 A1 **[3]**	si, does **not** need to be used Dim. correct equation, no extra forces Allow incorrect distances cao
	Total for Question 6	9	

Further Notes			
(a)	Consistently multiplying weights by g Part (a): The following incorrect answers are obtained. $R_D = 24g = 235 \cdot 2 = \frac{1176}{5}$ $R_C = 225g = 2205$ Award • SC2: Both correct • SC1: One Correct		
(a)	**Alternative Moments Solutions**		M1: Allow incorrect/signs distances
	Moments about $\boldsymbol{A}$ $R_C \times 1 \cdot 2 + R_D \times 3 = 180 \times 1 \cdot 9$ $R_C \times 1 \cdot 2 + R_D \times 3 = 342$	M1 A1	Dim. correct equation, oe, no missing forces Correct equation
	Moments about **Centre** $R_D \times 1 \cdot 1 + W \times 1 \cdot 9 = R_C \times 0 \cdot 7$ $R_D \times 1 \cdot 1 + 69 \times 1 \cdot 9 = R_C \times 0 \cdot 7$ $R_D \times 1 \cdot 1 + 131 \cdot 1 = R_C \times 0 \cdot 7$	M1 A1	Dim. correct equation, oe, no missing forces Correct equation
	Moments about $\boldsymbol{D}$ $W \times 3 + 180 \times 1 \cdot 1 = R_C \times 1 \cdot 8$ $69 \times 3 + 180 \times 1 \cdot 1 = R_C \times 1 \cdot 8$ $207 + 198 = R_C \times 1 \cdot 8$ $405 = R_C \times 1 \cdot 8$	M1 A1	Dim. correct equation, oe, no missing forces Correct equation
	Moments about $\boldsymbol{B}$ $W \times 3 \cdot 8 + 180 \times 1 \cdot 9 = R_C \times 2 \cdot 6 + R_D \times 0 \cdot 8$ $69 \times 3 \cdot 8 + 180 \times 1 \cdot 9 = R_C \times 2 \cdot 6 + R_D \times 0 \cdot 8$ $262 \cdot 2 + 342 = R_C \times 2 \cdot 6 + R_D \times 0 \cdot 8$ $604 \cdot 2 = R_C \times 2 \cdot 6 + R_D \times 0 \cdot 8$	M1 A1	Dim. correct equation, oe, no missing forces Correct equation
(b)	<u>Alternative Solution to (b)</u> For maximum W, rod will be on the point of turning about C, $R_D = 0$ Moments about a point other than C to get $\Rightarrow \quad R_C = 285$ Resolving vertically $285 = W + 180$ $W = 105$	 M1 m1 A1	 si, does **not** need to be used cao

Q7	Solution	Mark	Notes
(a)	Application of N2L, $a = \frac{25}{(t+2)^2}$ OR $1 \cdot 2a = \frac{30}{(t+2)^2}$ $\frac{dv}{dt} = \frac{25}{(t+2)^2}$ OR $1 \cdot 2\frac{dv}{dt} = \frac{30}{(t+2)^2}$	B1	Accept in terms of m
	$c\int dv = d\int (t+2)^{-2}dt$	M1	$a = \frac{dv}{dt}$ used, separation of variables and attempt to integrate Allow for $c\int dv = d\int (t+2)^{\pm 2}dt$
	$v = \frac{25}{-1}(t+2)^{-1}(+C)$ OR $1 \cdot 2v = \frac{30}{-1}(t+2)^{-1}(+C)$	A1	All correct, oe
	When $t = 0 \cdot 5, v = 20$ $(\Rightarrow C = 30,36)$	m1	Used $\left(\frac{1}{25}v = \cdots \Rightarrow C = 1.2\right)$
	$v = 30 - \frac{25}{(t+2)}$	A1	cao, oe
	As $t \to \infty, v \to 30$ (Limiting value $= 30$)	B1 **[6]**	FT $v = a - \frac{b}{(t+2)}$, $v \to a$
(b)	Substituting $v = 29$ into expression for v $29 = 30 - \frac{25}{(t+2)}$	M1	FT ANY $v = f(t)$ from (a)
	$t = 23$ s	A1 **[2]**	cao
	Total for Question 7	8	

Further Notes			
(a)	<u>Alternative Solution to (a)</u> Application of N2L, $a = \frac{25}{(t+2)^2}$ OR $1 \cdot 2a = \frac{30}{(t+2)^2}$	B1	Accept in terms of m
	$v = \int \frac{25}{(t+2)^2}dt$ $= 25\int (t+2)^{-2}\,dt$ $v = \frac{25}{-1}(t+2)^{-1}(+C)$	M1 A1	Attempt to integrate expression of form $(v =)\ d\int (t+2)^{\pm 2}dt$
	When $t = 0 \cdot 5, v = 20$ $(\Rightarrow C = 30)$	m1	
	$v = 30 - \frac{25}{(t+2)}$	A1	
	As $t \to \infty, v \to 30$ (Limiting value $= 30$)	B1	See FT in main MS

Q8	Solution	Mark	Notes
(a)			
	Perpendicular to plane: $R = 5g\cos 30°$ $\left(= \frac{5\sqrt{3}}{2}g = \frac{49\sqrt{3}}{2} = 42\cdot 435\ldots\right)$ Apply N2L up slope, upwards positive $0 \pm 5g\sin 30° \pm F = \pm 5a$ $0 - 5g\sin 30° - F = 5a$ $-24\cdot 5 - F = 5(-6\cdot 3)$ $-24\cdot 5 - F = -31\cdot 5$ $\Rightarrow$ $F = 7$ $F = \mu R$ $\left(7 = \frac{5\sqrt{3}}{2}g\mu = \frac{49\sqrt{3}}{2}\mu = 42\cdot 435\ldots\mu\right)$ $\mu = \frac{7}{\frac{5g\sqrt{3}}{2}} = \frac{2}{7\sqrt{3}}$ $\mu = \frac{2\sqrt{3}}{21}$ $(\mu = 0\cdot 1649\ldots)$	B1 M1 A1 M1 A1 **[5]**	si, any form Dim. correct, no missing/extra forces Any signs, allow $5g\cos 30°$ oe $5g\sin 30° + F = 5a$ with $a = 6\cdot 3$ Used, si, $F = (5g\cos 30°)\mu$ $\mu R = 7$ Convincing
(b)	Maximum friction (up slope) $F = \mu R = \frac{2\sqrt{3}}{21} \times 5g\cos 30° = \frac{5}{7}g = 7$ Component of weight (down slope) $= 5g\sin 30° = \frac{5}{2}g = \frac{49}{2} = 24\cdot 5$ Reference to weight **and** friction Component of weight > Friction A clear concluding statement For example, the object will • not remain at rest • move/slide • accelerate down the slope	M1 A1 **[2]**	From part (a) $24\cdot 5 > 7$ $24\cdot 5 \neq 7$ Convincing
	Total for Question 8	**7**	

Q9	Solution	Mark	Notes
(a)	$\mathbf{v} = \frac{\mathrm{d}\mathbf{r}}{\mathrm{d}t}$ $\mathbf{v} = (8t)\mathbf{i} + \left(t^3 + 9t^{\frac{1}{2}}\right)\mathbf{j}$ (ms^{-1}) At $t = 4$, $\mathbf{v} = 32\mathbf{i} + 82\,\mathbf{j}$ (ms^{-1})	M1 A1 A1 **[3]**	Correct differentiation of at least one term, $\mathbf{i}, \mathbf{j}$ retained All correct cao, condone '$\mathbf{v}$ =' missing isw, speed
(b)	(i) At $t = 4$, $\mathbf{r} = 64\mathbf{i} + 112\,\mathbf{j}$ After fuel runs out: working **vertically** using $s = ut + \frac{1}{2}at^2$, with $s = \pm 112, u = \pm 82, a = \pm g$ $\mp 112 = \pm 82t + \frac{1}{2}(\mp 9 \cdot 8)t^2$ $4 \cdot 9t^2 - 82t - 112 = 0$ $t = 18 \cdot 00423636$ $(t = -1 \cdot 269 \ldots)$	B1 M1 A1 A1	Sight of 64 or ± 112 FT 82, 112 for M1A1 $-112 = 82t + \frac{1}{2}(-9 \cdot 8)t^2$ $112 = -82t + \frac{1}{2}(9 \cdot 8)t^2$ Calculator may be used Convincing
	(ii) After fuel runs out: working **horizontally** (→) Distance travelled $= 32 \times 18 \cdot (004236 \ldots)$ $= 576 \cdot (13556 \ldots)$ Total horizontal distance travelled $= 64 + 576 \ldots \approx 640 \ldots . > 600$ Lands **outside** safe zone/ Does **not** land in the safe zone	M1 A1 **[6]**	Using distance = speed $\times$ 18 ... (allow anything that rounds to 18) Convincing, cao
	Total for Question 9	**9**	

Further Notes			
(b)	Alternative Solution to (i) & (ii)		
	At $t = 4$, $\mathbf{r} = 64\mathbf{i} + 112\,\mathbf{j}$	B1	Sight of 112 or 64
	Use of $\mathbf{r} = \mathbf{u}t + \frac{1}{2}\mathbf{a}t^2\ (+\mathbf{r_0})$,		
	with $\mathbf{u} = (32\mathbf{i} + 82\,\mathbf{j})$, $\mathbf{a} = \pm g\mathbf{j}, \mathbf{r} = k\mathbf{i}$	M1	Used FT part (a)
	$k\mathbf{i} = (32\mathbf{i} + 82\,\mathbf{j})t + \frac{1}{2}(-g\mathbf{j})t^2 \quad + (64\mathbf{i} + 112\,\mathbf{j})$	A1	Correct signs **AND** position vector $64\mathbf{i} + 112\,\mathbf{j}$
	Comparison of **i** OR **j** coefficients	M1	OR Award for Distance travelled $= 32 \times 18 \cdot (0 \ldots)$ when 18 is assumed
	j coefficients: $0 = 82t - 4 \cdot 9t^2 + 112$		
	$t = 18 \cdot 00423636 \qquad (t = -1 \cdot 269 \ldots)$	A1	Convincing
	i coefficients: $k = 32t + 64$		
	$k = 32(18 \cdot 00423636) + 64$		
	$k = 640 \cdot 13 \ldots > 600$		$k = 32(18) + 64 = 640$
	Lands **outside** safe zone/ Does **not** land in the safe zone	A1	Convincing, cao
		[6]	