Mark Scheme (Results)

November 2024

Pearson Edexcel International GCSE In Mathematics (4MB1) Paper 01

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

- **Types of mark**
  - M marks: method marks
  - A marks: accuracy marks
  - B marks: unconditional accuracy marks (independent of M marks)

- **Abbreviations**
  - cao – correct answer only
  - ft – follow through
  - isw – ignore subsequent working
  - SC - special case
  - oe – or equivalent (and appropriate)
  - dep – dependent
  - indep – independent
  - awrt – answer which rounds to
  - eeoo – each error or omission
  - cas – Correct answer scores full marks (unless from obvious incorrect working)
  - wr working required

- **No working**

  If no working is shown then correct answers normally score full marks

  If no working is shown then incorrect (even though nearly correct) answers score no marks.

- **With working**

  If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

  If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

  If a candidate misreads a number from the question. Eg. Uses 252 instead of 255; method marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

  If there is a choice of methods shown, then award the lowest mark, unless the subsequent working makes clear the method that has been used.

  If there is no answer on the answer line then check the working for an obvious answer.

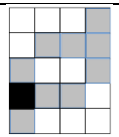
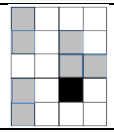
- **Ignoring subsequent work**

  It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

- **Parts of questions**
  Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded to another.

Question		Working	Answer	Mark	Notes
1			$7b(4a+3)$	2	B2 cao Do not ISW Condone a missing RH bracket (B1 for correct partial factorisation, eg $7(4ab+3b)$ or $b(28a+21)$ or for correctly identifying the HCF, eg $7b(xa+y)$ where x and y are integers) ISW for B1
					Total 2 marks

2	(a)			1	B1 for correct square and no incorrect squares shaded Allow any other clear indication that the correct square has been indicated
	(b)			1	B1 for correct square and no incorrect squares shaded Allow any other clear indication that the correct square has been indicated
					Total 2 marks

3		Overlay	Correct bisector	2	B2 for a correct bisector with 2 pairs of arcs (use overlay) must cross/touch *AB*. This needs to be within the tram lines if required to be extended (B1 for a correct bisector without arcs or a correct bisector with only one pair of arcs or 2 pairs of correct arcs without bisector drawn)
					Total 2 marks

4		$276-180$ or $90+(276-270)$ or $180-(360-276)$		2	M1 for a complete correct method to find the bearing e.g. 90 + 6 **Do not ISW** e.g. 276 – 180 = 96 180 – 96 = 84 scores M0
			096		A1 for 096 accept 96 Do not ISW
cas					***Total 2 marks***

5		$\frac{3}{7}x = 18$ oe		2	M1 for a correct equation in the form $ax = b$ e.g. $3x = 126$ Condone awrt $0.43x = 18$ or $0.42x = 18$ or $\frac{5-2}{7}x = 18$ May be implied by $[x =]$ 42 or $\left[x =\right]\frac{126}{3}$
			42		A1 cao Accept $\left[x =\right]\frac{126}{3}$ oe
cas					***Total 2 marks***

6		$2^2 \times 3^2 \times 7^4$ or $2^2 \times 3^2 \times 5^0 \times 7^4$		2	M1 for 2 correct terms written in a product e.g. $2^2 \times 3^2$ ignore any other terms. Do not accept $2^x \times 3^2 \times 7^4$ as this is *A* which is given in the question
			86 436		A1 for 86 436 or $2^2 \times 3^2 \times 7^4$ or $2 \times 2 \times 3 \times 3 \times 7 \times 7 \times 7 \times 7$
cas					***Total 2 marks***

7		$0.03 + 0.32 + 0.07[= 0.42]$ oe or $p \times 300$		2	M1for a correct method to find P(>3) e.g. $(1-(0.1+0.3+0.18))$ or $p \times 300$ where $0 < p < 1$ Allow $\frac{21}{50}$ to imply 0.42 Allow $\frac{126}{300}$
			126		A1 cao Do not allow $\frac{126}{300}$ as a final answer
cas					***Total 2 marks***

8		$171 \div 3 [= 0.57]$ or $1.71 \times \frac{2}{3} [= 1.14]$		3	M1 for a correct first step to find the cost of 1 kg of onions, or to find the cost of 2 kg of onions. May be implied by 0.57 or 1.14 or 5 kg of potatoes = 4.2[0] or 1kg of potatoes = 0.84 or 3 kg of potatoes = 3.36
		$(5.34 - 2 \times "0.57") \div 5 [= 0.84]$ or $(5.34 - "1.14") \times \frac{4}{5} [= 3.36]$			M1 for a correct method to find 1 kg of potatoes or to find 4 kg of potatoes
			5.07		A1 cao
cas					***Total 3 marks***

9		$12 \times 5.5 [= 66]$ $12 \times 6 [= 72]$ $5.5 \times 6 [= 33]$		3	M1 for a correct method to find at least 2 different areas May be embedded in an attempt to find the total surface area
		$("66" + "72" + "33") \times 2$			M1 dep on 1st M1 for a complete correct method to find the surface area
			342		A1 cao
cas					***Total 3 marks***

10		Gradient $= \frac{\text{change in } y}{\text{change in } x}$ eg $\frac{-6}{3}[=-2]$		3	M1 for a correct method to find the gradient of $\mathbf{L}_1$, eg $\frac{-6}{3}$ oe or "m" $= -2$ Allow any expression that evaluates to -2 or $-2x$ (May be implied by $-2x \pm c$)
		$12 = m \times -9 + c$ or $y - 12 = m(x - -9)$ where m is their gradient			M1 for substituting $x = -9$ and $y = 12$ into the equation of a line ft their gradient (May be implied by $-2x - 6$)
			$y = -2x - 6$		A1 for $y = -2x - 6$ do not ISW, allow $y = -6 - 2x$ Must see $y =$ on answer line or if not on the answer line, then award this mark if seen in the working
cas					***Total 3 marks***

11		for 0.0005 or 5×10^{n} $n < 0$ or $m\times10^{-4}$ $1 \leqslant m < 10$		2	M1 Allow any correct answer not in standard form e.g. 0.5×10^{-3} oe
			5×10^{-4}		A1 cao Do not ISW
cas					***Total 2 marks***

12		$B : D = 15 : 16$ oe or $A : C = 18 : 55$ oe		3	M1 for a correct ratio May be implied by $C : D = 55 : 48$ oe Allow $D = 16$ or $C = 55$
		$B:C:D = 45:55:48$ oe or $A:C:D = 18:55:48$ oe or $A : B : C : D = 18 : 45 : 55 : 48$ oe			M1 for a correct ratio May be implied by $C : D = 55 : 48$ oe e.g. 165 : 144
			55 : 48		A1 allow $1 : \frac{48}{55}$ or $\frac{55}{48} : 1$
	ALT	$\frac{A}{B} = \frac{2}{5}$ $\frac{A}{D} = \frac{3}{8}$ $\frac{B}{C} = \frac{9}{11}$ $\frac{C}{D} = \frac{11}{9} \times \frac{5}{2} \times \frac{3}{8}$ or $\frac{D}{C} = \frac{9}{11} \times \frac{2}{5} \times \frac{8}{3}$			M2 for a correct method to find $\frac{C}{D}$ or $\frac{D}{C}$ May be implied by $\frac{48}{55}$ oe or $\frac{55}{48}$ oe (M1 for any 2 correct fractions multiplied together e.g. $\frac{11}{9} \times \frac{5}{2}$ May be seen in a calculation of 3 fractions multiplied together) Allow decimal equivalents if 2 decimal places or better
			55:48		A1 allow $1 : \frac{48}{55}$ or $\frac{55}{48} : 1$
cas					***Total 3 marks***

13		$\tan(32)=\frac{\text{height}}{12.2}[\Rightarrow \text{height}=7.62...]$ or $\tan(58)=\frac{12.2}{\text{height}}[\Rightarrow \text{height}=7.62...]$ or $\frac{\text{height}}{\sin 32}=\frac{12.2}{\sin 58}[\Rightarrow \text{height}=7.62...]$ or $\text{height}=\sqrt{\left(\frac{12.2}{\sin 58}\right)^2-12.2^2}[=7.62...]$		3	M1 for a correct trig statement or a fully correct method to find the height. May be implied by awrt 7.6 oe awrt 8.1 (calc set in rads) or awrt 6.7 (calc set in grad)
		$7.62...+1.7$			M1 for a complete correct method to find *CD* e.g. awrt 7.6 + 1.7 (Allow ft provided that "7.62…" has come from using a trig statement)
			9.32		A1 for awrt 9.3
cas					***Total 3 marks***

14		$\frac{20x-20-28x+70}{28}$ or $\frac{10x-10-14x+35}{14}$ or $\frac{5x}{7}-\frac{5}{7}-\frac{4x}{4}+\frac{10}{4}$ or $\frac{5x}{7}-\frac{5}{7}-x+\frac{5}{2}$		3	M2 for a fully correct expression (M1 for $20x-20-28x+70$ or $10x-10-14x+35$ (Allow 1 sign error) (May be implied by $-8x+50$ or $-4x+25$) or $\frac{5x-5}{7}-\frac{4x-10}{4}$ or $\frac{5x}{7}-\frac{5}{7}-\frac{4x}{4}+\frac{10}{4}$ (Allow one sign error) or an expression with a denominator of 28 or 14)
			$\frac{25-4x}{14}$		A1 accept $\frac{-4x+25}{14}$ or $-\frac{2x}{7}+\frac{25}{14}$ Do not ISW
cas					***Total 3 marks***

15		$96\times12[=1152]$ or $98\times14[=1372]$ or $98\times2[=196]$ or $12\times2[=24]$		4	M1 for a correct method to find the total points after 12 games or after 14 games or for finding the total points for the 2 extra games or the extra points for the 12 games. May be implied by 220
		$98\times14-96\times12[=220]$ or $98\times2+12\times2[=220]$			M1 for a correct method to find the total points scored in games 13 and 14
		$"220"\times\frac{3}{5}$ oe			M1 dep on 2nd M1 for correct use of the ratio to find the score in game 14
			132		A1 cao
cas					***Total 4 marks***

16		$\angle BEF = \angle ABE [= 180 - 113] = 67$ or $\angle EBG = \angle GBE \left[= \frac{94}{2} \right] = 47$ or $\angle CBE = 113$		4	M1 for finding $\angle BEF$ / $\angle ABE$ / $\angle EBG$ / $\angle GBE$ / $\angle CBE$ e.g. $\angle EGB = \frac{180 - (180 - 86)}{2} [= 47]$ (May be seen on the diagram) May be implied by the 2nd M mark
		$[\angle CBG =] 180 - "47" - "67"$ or $[\angle CBG =] 113 - "47"$			M1 for a correct method ft their $\angle BEF$ / $\angle ABE$ / $\angle EBG$ / $\angle GBE$ if clearly labelled or marked on the diagram
cas			66		A1 for 66
		Alternate angles are equal Corresponding angles are equal Co-interior angles / allied angles add up to 180° Angles in a triangle add to 180° Angles on a straight line add to 180° Base angles in an isosceles triangle (are equal) The exterior angle of a triangle is equal to the sum of the interior opposite angles			B1 dep on M1M1A1 being awarded and at least **one** correct reason stated for their method. Must include the underlined words Condone Δ for triangle and $\angle$ for angle Condone Alt for alternate, Co-int for co-interior, ext for exterior and opp for opposite Iso(s) for Isosceles
					Total 4 marks

17		$15500\times\left(\frac{100-8}{100}\right)[=14260]$ or $15500-\left(\frac{8}{100}\times 15500\right)[=14260]$		4	M1 for a correct method to find the value in 2014 May be implied by 14260 or 13946.28 (allow 13946.3 or 13946)
		$"14260"\times\left(\frac{100-2.2}{100}\right)[=13946.28]$ or $"14260"-\left(\frac{2.2}{100}\times"14260"\right)[=13946.28]$			M1 dep on 1st M1 for a correct method to find the value in 2016 May be implied by 13946.28 (Allow 13946.3 or 13946)
		$\left(\frac{("13946.28"-13137.40)}{"13946.28"}\right)[\times 100]$ oe or $\left(1-\frac{13137.40}{"13946.28"}\right)[\times 100]$			M1 dep on 2nd M1 for a correct method to find the multiplier for the final change e.g. $"13946.28"-("13946.28"\times x)=13137.40$ May be implied by awrt 5.8 or 0.058
			5.8		A1 awrt 5.8 Condone awrt 5.8%
					SC If they do an 8% increase followed by a 2.2% increase then award B1 for awrt 0.23 or awrt 23%
cas					***Total 4 marks***

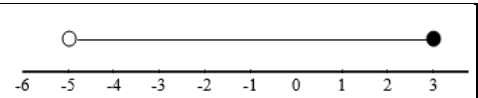
18		$r^2 = \dfrac{5t-7}{8-3t}$		4	M1 for removing square root. Allow $r^2 = \left(\sqrt{\dfrac{5t-7}{8-3t}}\right)^2$ May be implied by $8r^2 - 3r^2t = 5t - 7$
		$8r^2 - 3r^2t = 5t - 7$			M1 dep on 1st M1 for multiplying by the denominator and expanding correctly to form a correct equation.
		$8r^2 + 7 = 5t + 3r^2t$			M1 ft their equation. For gathering the terms in *t* on one side and the other terms on the other side of an equation. This is dep on having 2 terms in *t*, exactly one of these must contain *r* or r^2, and two other terms on the other side of the equation (this must be correct for their equation)
			$t = \dfrac{8r^2+7}{5+3r^2}$		A1 oe e.g. $t = \dfrac{-8r^2-7}{-5-3r^2}$ Must see *t* = on answer line or if not on the answer line, then award this mark if seen in the working Do not ISW
cas					***Total 4 marks***

19	(a)	$\begin{pmatrix}(2\times3+1\times0) & (2\times(-3)+1\times2)\\(4\times3+3\times0) & (4\times(-3)+3\times2)\end{pmatrix}$	$\begin{pmatrix}6 & -4\\12 & -6\end{pmatrix}$	2	B2 cao (B1 for 2 terms correct)
	(b)	$\frac{1}{3\times6-2\times5}\begin{pmatrix}6 & -2\\-5 & 3\end{pmatrix}$		2	M1 for a correct determinant or matrix element of the inverse e.g. $3\times6-2\times5$ or $\begin{pmatrix}6 & -2\\-5 & 3\end{pmatrix}$ with all 4 terms correct or $\begin{pmatrix}\frac{3}{4} & -\frac{1}{4}\\-\frac{5}{8} & \frac{3}{8}\end{pmatrix}$ with 2 terms correct
			$\begin{pmatrix}\frac{3}{4} & -\frac{1}{4}\\-\frac{5}{8} & \frac{3}{8}\end{pmatrix}$		A1 oe Allow $\frac{1}{8}\begin{pmatrix}6 & -2\\-5 & 3\end{pmatrix}$ ISW
cas					***Total 4 marks***

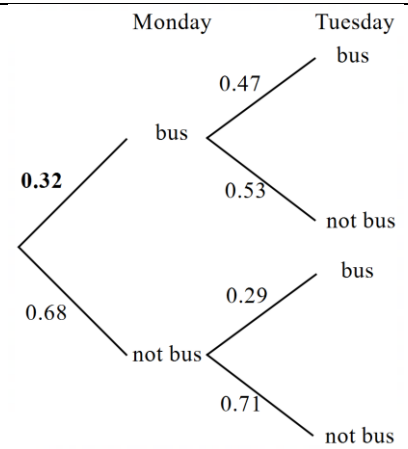
20		$\angle AEF = 63$ or $\angle ACE = 63$ or $\angle OCE = \angle OEC = 29$ or $\angle OAC = \angle OCA = 34$ or		4	B1 May be seen on the diagram May be seen embedded in a correct calculation for another angle May be implied by 1st M1
		$\angle AEC = 180 - 61 - 63[= 56]$ **and** $\angle ABC = 180 - "56"[= 124]$ or $\angle AOE = 180 - 2 \times 27[= 126]$ **and** $\angle COE = 180 - 2 \times 29[= 122]$ **and** $\angle ABC = \frac{"126" + "122"}{2}[= 124]$ or $\angle AEC = 27 + 29 = [56]$ **and** $\angle ABC = 180 - "56"[= 124]$			M1 for a correct method to find $\angle ABC$ (Allow $\angle B$ for $\angle ABC$) May be implied by $\angle BCA / \angle BAC = 28$ May be seen on the diagram Do not ft their 63, 29 or 34
		$\angle BCA = \frac{1}{2}(180 - "124")[= 28]$ **and** $\angle BCE = 63 + "28"$ or $\angle BAC = \angle BCA = \frac{1}{2}(180 - "124")[= 28]$ **and** $\angle BCE = 34 + "28" + 29$ or $\angle BCE = 180 - ("28" + 34 + 27)$ or $\angle BAC = \angle BCA = \frac{1}{2}(180 - "124")[= 28]$ **and** $\angle BCE = 34 + "28" + 29$ or $\angle BCE = 180 - ("28" + 34 + 27)$			M1 dep on 1st M1 for a correct method to find *BCE* Do not ft their 63/29/34
			91		A1 Dep on 2nd M1

					Total 4 marks

21		$v_{UB} = 25.45 \quad v_{LB} = 25.35$ $u_{UB} = 9.5125 \quad u_{LB} = 9.5115$ $s_{UB} = 17.5 \quad s_{LB} = 12.5$		4	M1 for one correct bound
		$[a =] \dfrac{v^2 - u^2}{2s}$ or $v^2 - u^2 = 2as$			M1 for substitution of at least 2 from $25.4 < v \leqslant 25.45$ $9.5115 \leqslant u < 9.512$ $12.5 \leqslant s < 15$ into a formula or expression involving *v*, *u* and *s* e.g. $v - u = 2as$
		$[a_{UB} =] \dfrac{v_{UB}^{\ 2} - u_{LB}^{\ 2}}{2 \times s_{LB}}$ or $v_{UB}^{\ 2} - u_{LB}^{\ 2} = 2as_{LB}$			M1 for substitution of *v*, *u* and *s* into a correct formula or expression where $25.4 < v \leqslant 25.45$ $9.5115 \leqslant u < 9.512$ $12.5 \leqslant s < 15$
			$\dfrac{25.45^2 - 9.5115^2}{2 \times 12.5} = 22.3$ or $25.45^2 - 9.5115^2 = 2a \times 12.5$ $\Rightarrow a = 22.3$		A1 dep on correct working for awrt 22.3
					Total 4 marks

22	(a)		Shown	2	B2 for a fully correct diagram. Must be a single line (B1 for an open circle at −5 **and** a closed circle at 3 or a single line from −5 to 3 Allow (for an open circle and] as a closed circle
	(b)	$4x+2 \geqslant 21-6x$		3	M1 for a correct expression after expanding the bracket (accept use of = or > or < or $\leqslant$ for $\geqslant$)
		$4x+6x \geqslant 21-2$			M1 for isolating the x terms e.g. $2-21 \geqslant -6x-4x$ (accept use of = or > or < or $\leqslant$ for $\geqslant$) Allow $19 \leqslant 10x$ (accept use of = or < or > or $\geqslant$ for $\leqslant$)
			$x \geqslant 1.9$		A1 Allow $x \geqslant \frac{19}{10}$
					Total 5 marks

23	(a)	$2\times(-5)^3+9\times(-5)^2-11\times(-5)-30$		2	M1 for correct substitution of x = –5 into the given expression (allow one error)
			= 0		A1 dep on M1 must have no errors and = 0
	(b)	$2x^2...$		4	M1 for a start to find the quadratic factor. This may be seen in part (a)
		$2x^2-x-6$			M1 for a fully correct 3 term quadratic. This may be seen in part (a)
		$(2x+3)(x-2)$			M1 for an attempt at factorisation of their 3TQ – Must multiply out to give 2 of their 3 terms
			$(x + 5)$ $(x – 2)$ $(2x + 3)$		A1 Dep on the 2nd and 3rd M marks being awarded. Only accept what is seen (any order). Condone = 0 but do not ISW if they go on to solve. **NB A correct answer with no working scores 0/4**
					Total 6 marks

24	(a)			2	B2 for a completely correct tree diagram (B1 for at least two probabilities correctly placed)
	(b)	$0.32\times"0.47"[=0.1504]$ or $0.32\times"0.53"[=0.1696]$ or $"0.68"\times"0.29"[=0.1972]$ or $"0.68"\times"0.71"[=0.4828]$		3	M1 for one correct product, (ft their tree diagram, provided these are probabilities)May be implied by $\frac{64}{625}$ or $\frac{106}{625}$ or $\frac{493}{2500}$ or $\frac{1207}{2500}$ or 0.3668 or $\frac{917}{2500}$
		$("0.32\times0.53")+("0.68\times0.29")[=0.3668]$ or $1-(("0.32\times0.47")+("0.68\times0.71"))[=0.3668]$			M1 for a complete correct method to find the probability that Lethna takes the bus on exactly one day (ft their tree diagram, provided these are probabilities). May be implied by $\frac{917}{2500}$
			F with correct figures		A1 for *F* (Allow *F* > *E*) with 0.4828/0.483/0.48 and 0.3668/0.367/0.37/0.36 Allow *F* with $\frac{1207}{2500}$ and $\frac{917}{2500}$
					Total 5 marks

25		$5.5x+55=3x^2+16x-35$ or $y=3\left(\frac{2}{11}y-10\right)^2+16\left(\frac{2}{11}y-10\right)-35$		7	M1 for correct substitution of the linear equation $2y-11x=110$ into the quadratic equation $y=3x^2+16x-35$ to form an (unsimplified) equation in either x or y. This mark can be implied by a fully correct 3 term quadratic
		$6x^2+21x-180[=0]$ oe or $12y^2-1089y+12705[=0]$ oe			M1 for a 3 term quadratic in either x or y with at least 2 out of 3 terms correct
		$(x-4)(6x+45)$ oe or $(y-77)(12y-165)$ oe			M1 for a correct method to solve their 3 term quadratic – either by formula, complete the square or factorising. By factorising: brackets must expand to give 2 out of the 3 correct terms. By formula: correct substitution into fully correct formula (allow 1 sign error). By completing the square: must see $a\left(x+\frac{b}{2a}\right)^2\pm...[=0]$ If the 3 term quadratic is incorrect then working must be shown. May be implied by $x = 4$ and –7.5 or $y = 77$ and 13.75 May be seen as coordinates on the diagram
		$y=5.5\times"4"+55[=77]$ or $y=5.5\times"-7.5"+55[=13.75]$ or $x=\frac{2}{11}\times"77"-10[=4]$ or $x=\frac{2}{11}\times"13.75"-10[=-7.5]$			M1 for a correct method to find a y value using their x value or a correct method to find an x value using their y value. If the values of x or y are incorrect then working must be shown to find the corresponding values of y or x. May be implied by (4, 77) or (–7.5, 13.75) May be seen as coordinates on the diagram
		$[P=](4, 77)$ and $[Q=](-7.5, [13.75])$			A1 for correct coordinates of P **and** x-coordinate of Q May be implied by $x = 4$, $x = –7.5$ and $y = 77$ May be seen as coordinates on the diagram
		$\frac{1}{2}\times(77-0)\times(4--7.5)$ or			M1 for a fully correct method to find the area (we do not ft their coordinates) Allow use of alternative methods e.g. allow use of $\frac{1}{2}ab\sin C$

		$\frac{1}{2}(77+13.75)\times 11.5-\frac{1}{2}\times 11.5\times 13.75$			if the length of the sides are PQ = awrt 64, PR = 77, QR = awrt 18 and $\angle PQR$ = awrt 130 or $\angle QRP$ = awrt 39/awrt 40 or $\angle QPR$ = awrt 10
			Shown		A1 dep on all 5 M marks for 442.75 with no errors
					Total 7 marks

26	(a)	$EC = \frac{2}{5} \times 15.5 [= 6.2]$ $ED = \sqrt{8.2^2 - "6.2"^2}$ | $\cos \angle ECD = \frac{"6.2"}{8.2}$ $[\Rightarrow \angle ECD = 40.878...]$ $ED = 8.2 \times \sin("40.8...")$ or $ED = "6.2" \times \tan("40.8...")$ | $\sin \angle EDC = \frac{"6.2"}{8.2}$ $[\Rightarrow \angle EDC = 49.121...]$ $ED = 8.2 \times \cos("49.1...")$ or $\tan("49.1...") = \frac{"6.2"}{ED}$		2	M1 for a complete correct method to find *ED*
cas			5.37		A1 for awrt 5.4 Allow $\frac{12\sqrt{5}}{5}$
	(b)	$\frac{1}{2} \times 15.5 \times "5.37" [= 41.6175]$ or $\frac{1}{2} \times 9.3 \times "5.37" + \frac{1}{2} \times 6.2 \times "5.37" [= 41.6175]$		7	M1 for a complete correct method to find the base area of **P** If using $\frac{12\sqrt{5}}{5}$ then the exact answer is 41.5908…
		$[EB =] \frac{"5.37"}{\tan(71)} [= 1.849...]$ or $"5.37" \times \tan(19) [= 1.849...]$ or $[BE =] \frac{"5.37"}{\sin 71} \times \sin 19 [= 1.849...]$ or $\sqrt{\left(\frac{"5.37"}{\sin 71}\right)^2 - "5.37"^2} [= 1.849...]$			M1 for a complete correct method or expression to find *EB* Exact answer is 1.84785…
		$\left(\frac{64.9}{"41.6175"}\right)^{3/2} [= 1.94....]$ or $\sqrt{\frac{"41.6175"}{64.9}} [= 0.80....]$ or $\left(\frac{"41.6175"}{64.9}\right)^{3/2} [= 0.51....]$ or $\sqrt{\frac{64.9}{"41.6175"}} [= 1.24....]$			M2 for a complete correct method to find the volume SF or the length SF. May be done in stages. Exact answers are 1.94926…, 0.51301… 0.80052…, 1.24917… (M1 for a complete correct method to find the area SF e.g. $\frac{64.9}{"41.6175"} [= 1.55...]$ or $\frac{"41.6175"}{64.9} [= 0.64...]$ Exact answers are 1.56043…, 0.64084…)
		$\frac{1}{3} \times "41.6175" \times "1.849..." [= 25.65...]$ or $"1.849..." \times "1.24..." [= 2.30...]$ or $"1.849..." \div "0.80..." [= 2.30...]$			M1 for a complete correct method to find the volume of **P** or the vertical height of **T** Exact answers are 25.61797…2.30829…

					This may be embedded in a calculation for the volume of T e.g. $\left(\frac{1}{2}\times 15.5\times "5.37"\right)\times "1.849..."\times\frac{1}{3}\times "1.94..."$
		"25.6..."×"1.94..." or "25.6..."÷"0.51..." or $\frac{1}{3}\times 64.9\times "2.30..."$			M1 dep on 5 previous M marks being awarded for a complete correct method to find volume of T
			50.0		A1 awrt 49.9 or 50 from no incorrect working
					Total 9 marks

27		$\left[\frac{dy}{dx}=\right]18x-16$		6	M1 Attempt to differentiate ie $x^n \to x^{n-1}$ for at least one non zero term correct
		$18x-16=6.5$			M1 dep on a linear expression in the form $ax+b=c$ where $c\neq 0$ Can be implied by x = 1.25 oe
		$x=\frac{6.5+16}{18}[=1.25]$			M1 dep on previous M1 for solving their linear expression correctly leading to x = …
		$y=9\times 1.25^2-16\times 1.25+5[=-0.9375]$			M1 dep on 1st M1 for substitution of their x value into $y=x^2-16x+5$ (May be implied by awrt – 0.9 or $-\frac{15}{16}$) If the x value is incorrect then working must be shown
		$\sqrt{(1-"1.25")^2+(-2+"0.9375")^2}$ oe			M1 dep on previous M1 for a correct method to find length PQ e.g. $\sqrt{("1.25"-1)^2+(-"0.9375"+2)^2}$ or $\sqrt{("0.25")^2+("1.0625")^2}$
			1.09		A1 dep 1st M and 5th M marks being awarded awrt 1.09 Allow 1.1 or $\frac{\sqrt{305}}{16}$ ISW
					Total 6 marks

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