

UNIT 2 - HIGHER TIER

Applications Unit 2 January 2013 Higher Tier GCSE				Final													
1.(a) 4.5(00 m) (b) 3200 × 750 with an attempt to change units 2.4 (m²) (c) 600 × 750 × = 405 000 000 900 (mm)				B1 M1 A1 M1 A1 5	Attempt to change units needs evidence of ÷10 ⁿ where n≥3 Or equivalent method												
2.(a) All 8 points correctly plotted (b) (£)40 (c) Implies “no” with a reason (e.g. points scattered, or not in line, etc.)				B2 B1 E1 4	B1 for at least 6 points correctly plotted, OR all correctly plotted but joined dot-to-dot OR FT from their graph for their oldest clock Accept statements saying it is ‘not positive and not negative correlation’												
3. (a) (i)250 × 4.37 = 1092.5(0) (Buys)1050 (zloty) (ii) 1050 ÷ 4.37 = (£)240.27(46) (b) (1050 – 340.40 ÷) 709.6(0) 709 ÷ 4.43 (£) 160.04				M1 A1 A1 M1 A1 B1 M1 A1 8	FT provided M1 awarded FT ‘their 1050 zloty’ provided rounded to the nearest 50,must be in zloty not £s FT ‘their (a)’ provided >340.40 FT rounding down their 709.60 to whole number Accept (£)160.05 An answer of (£)160.18 should be awarded B1 then SC1 in (b) An answer of (£)160.27 should be awarded SC1, with B1 only if 709.6(0) seen												
4. No, Yes, No Far Flung: No and most expensive or most often late Statement that implies Celtic Flights is more reliable than Roly Air				B1 E1 E1 3	Accept percentages used within comparison Do not accept percentages quoted without interpretation. Accept statements such as ‘ <u>only</u> 74%’ as a comparison No with statement of 1 of the 2 reasons Unambiguous and not contradicted. In either reason box for Celtic Flights or Roly Air												
5.(a) (245/9.8(0) - 17) or (245–9.8(0)×17)÷9.8(0) (=25 – 17 = 8) (78.4(0) ÷9.8(0) =8) ÷2 Conclusion D4 entry is 4 (i.e. half their 8) (b) (=) C3 × B3 + 2 × D3 × B3 OR (=) C3 × B3 + D3 × B3 + D3 × B3 OR (=) (2 × D3 + C3) × B3 OR equivalent				M1 m1 A1 B4 7	Or equivalent method that could lead to 8 Depends on M1. May be embedded CAO A correct answer in the table gets M1, m1, A1 Ignore ‘E3 =’. Accept ‘*’ as ‘×’ Award B3 for sight of C3 × B3 + D3 × B3, or 2 × D3 × B3, or D3 × B3 + D3 × B3, or (2 × D3 + C3) Award B2 for sight of ‘B3×C3’ or ‘B3×D3’ Award B1 if shown numerically, with an attempt then to use a cell reference <i>Penalise consistent incorrect row -1 only</i>												
6.(a) 5 4 and 2 5 only (with no other entries) (b) <table><tr><td></td><td>Median in £</td><td>Range in £</td><td>Mode in £</td></tr><tr><td>NewKey</td><td>23</td><td>40</td><td>23</td></tr><tr><td>eLime</td><td>36</td><td>37</td><td>31</td></tr></table> (c) Shows understanding that the pie charts don’t show how many phones were sold					Median in £	Range in £	Mode in £	NewKey	23	40	23	eLime	36	37	31	B2 B4 B1 7	B1 for either entered correctly <i>FT their 2 entries, or ‘nil entries’, or if 1 extra entry to mark (b).</i> However if responses in (b) are correct then award marks as appropriate Median, mode and range correct, OR B3 for 4 or 5 correct entries B2 for 3 correct entries B1 for 1 or 2 correct entries
	Median in £	Range in £	Mode in £														
NewKey	23	40	23														
eLime	36	37	31														

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7.(a) (Driftwood) $\frac{68 \times 36 - 2000}{2000} (\times 100)$ 22.4(%) (Grain Bank) $0.1 \times 2000 + 15 \times 146 (= 2390)$ $\frac{\text{'their 2390' } - 2000}{2000} \times 100$ 19.5(%) Other considerations, e.g. reference to time period Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £, % being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer (b)(i) $26.60/3.5$ (£)7.6(0) (ii) $26.60/1.3$ (£)20.46	M1 A1 M1 m1 A1 E1 Q W C 2	(2448 – 2000)/2000 or 0.224 Accept 22(%) from correct working <i>If no marks SC1 for an answer of 122(.4%)</i> (200+2190-2000)/2000 or 0.195 An answer of 19(%) or 20(%) is A0 <i>If M1 only, then also award SC1 for an answer of 119.5(%), 119(%) or 120(%)</i> Accept reasonable ideas, i.e. 'consider other bank terms/rates', 'length of time business will last', 'able to repay the loan each month' QWC2 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar. For an answer of 8.06, implying division by 3.3, award SC1 Accept (£)20.47 Award M1 only for 20.4615...
8. $2f + 3g = 5$ and $3f + 4g = 4$ Method, e.g. equal coefficients Correct first variable Method to find 2 nd variable, e.g. substitution Correct second variable	B1 M1 A1 m1 A1 5	FT provided at least 1 correct equation and solving is of equivalent difficulty Allow 1 slip in non-equalised variable $f = -8$ or $g = 7$
9.(a) $34990 / 1.175$ $\times 1.24$ 36930 (euros) (b) Sight of 1769.5 (mm) Sight of 2007.5 (mm) $2007.5 - 1769.5 (\div 2)$ (One wing mirror) 119(mm) (c) $11.5 \times 7.5 \times 5.5$ 474.4(cm ³)	M1 M1 A2 B1 B1 M1 A1 M1 A2 11	(29778.72(34)) Independent of 1 st M1 CAO Not FT from M0, M1. A1 for 36925(.617 euros) or if incorrectly rounded to 36920 If M0, M1 also allow SC1 for an answer of 35790 (euros) Or half of this Or half of this Must FT from correct working A1 for 474.375 rounded or truncated, but not to 1dp as required An answer of 472.4699... comes from 11.49, 7.49 and 5.49 which is M0, A0, A0
10.(a) 2.0×10^4 (b) 1.1×10^5	B2 B2 4	B1 for 2×10^4 or $1.9(984) \times 10^4$. B1 for $1.(05191) \times 10^5$
11. Opposite = $\tan 56^\circ \times 19$ = 28.168658...(m) Height of the tree = 29.968658...(m)	M2 A1 A1 4	M1 for $\tan 56^\circ = \text{opposite}/19$ Accept rounded or truncated from working Accept rounded or truncated from working, and FT from their rounded or truncated 28.168...

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12.(a) $t + f \leq 30$ and $3t + 4f \geq 80$	B3	B2 for $t+f \leq 30$ and $3t+4f \dots 80$, or $t+f \dots 30$ and $3t+4f \geq 80$, or $t+f < 30$ and $3t+4f > 80$ B1 for either inequality correct, or $t+f \dots 30$ and $3t+4f \dots 80$ FT their inequalities if possible provided similar level of difficulty
(b) Line $t+f=30$ drawn correctly Line $3t+4f=80$ drawn correctly The region indicated	B1 B1 B1	FT from 2 lines with at least one line drawn correctly OR FT their graph for whole number solutions only
(c) Any correct point from the correct region, using whole numbers only	B1 7	
13.(a) Calculation that would lead to a correct answer for TOTAL 2009, 2010, 2011 and 2012	M1	Calculations are: 2009: 2300 2010: 2300×3 2011: $2300 \times 3 \times 3$ 2012: $2300 \times 3 \times 3 \times 3$
92000 (T-shirts)	A2	A1 for correct answer for 2009, 2010, 2011 & 2012 as 2300, 6900, 20700, 62100 T-shirts SC1 for an answer of 6900, 20700 or 62100 T- shirts only <i>Treat starting with 2009 as 2300×3 and continuing with appropriate pattern of trebling as MR-1 and mark accordingly</i>
(b) Idea that 3.60 is 112% of previous year price $3.60 \div 1.12^3$ (£)2.56	B1 M2 A1	M1 for equivalent of $3.60 \div 1.12$
(c) Strategy to use quadratic similarity	S1	This may be linear or cubic <i>The following answers imply S1: for linear, 6.468 or 6.46 or 6.47 for cubic, 12.677 or 12.67 or 12.68</i>
Sight of 50^2 with 70^2 , or 5^2 with 7^2 , or 1.4^2 , or $(5/7)^2$ $(4.62/50^2) \times 70^2$ or equivalent (£)9.06	M1 A1 A1 11	Accept (£)9.05(52)
14.(a) Area of 5 faces of the cuboid $2304 \text{ (cm}^2\text{)}$	B1	$(144 + 540 + 540 + 540 + 540 = 2304)$
Slant height ² = $18^2 + 6^2$ (=360) Slant height = 18.97.... or 19(cm)	M1 A1	Or alternative complete method
Area 1 triangular face = $\frac{1}{2} \times 12 \times \text{'slant height'}$ (=113.84..) OR 4 triangular areas (= 455.36798...) Total area 2759.36798...(cm ²) (£0.045 × Total area =) (£) 124.17	M1 A1 B1	FT for their 18.97, provided not 18 Rounded or truncated FT provided includes 'their area of 4 triangles' and 'their total area of rectangles' only if at least 4 rectangles have been considered <i>Allow rounding or truncation errors if method clear, however if consistent rounding or truncation errors then penalise PR-1</i>
(b) Appropriate sketch (may be implied) with realisation that 1 st step is to find the height/length of the cylinder, then subtraction from 22 will give the height of the cone	S1	
$\Pi \times 6^2 \times \text{height of cylinder} = 1018$ Height of the cylinder 9(.00..cm) Volume cone = $\frac{1}{3} \times \Pi \times 6^2 \times (22 - \text{height of cylinder})$ Volume cone, answers in range 489.8 to 490.3 (cm ³) Overall volume 1.5 (litres)	M1 A1 M1 A1 A1 12	FT '22 – their height of cylinder' CAO from correct working