

# **GCSE MARKING SCHEME**

# **MATHEMATICS - UNITISED**

# **SUMMER 2012**

#### INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2012 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

## UNIT 1 (FOUNDATION TIER)

JUNE 2012	Mork	FINAL MARK SCHEME
UNIT 1 Foundation	WIAIK	Comments
1. (a) (i) Twenty thousand six hundred and eight.	B1	Ignore incorrect spelling.
13 079.	B1	
(ii) 33 700	B2	F.T. their votes in figures for F. Dodd.
		B1 for sight of 33687 (or an accurate F.T. total)
1. (b)		Accept any unambiguous indication of correct choice.
(Football pitch) metre	B1	
(Thickness of letter) millimetre	B1	
2. (a) 72	B1	
90	B1	
(b) Laura's by 18(cm)	B1	F.T. their measurements.
3. Indicates that 3 games are won.	B1	This may be implied.
$(2 \times 0 +)  5 \times \frac{1}{2}  +  3 \times 1$	M1	Two out of 0, 2 <sup>1</sup> / <sub>2</sub> and 3 AND added gains an M1.
		F.T. their number of winning games if $> 0$ .
$=5\frac{1}{2}$ ISW	A1	
4. (a) Tue Sat	B2	B1 for each.
$-2(^{\circ}C)$ $-5(^{\circ}C)$		
(b) 7(°C)	B1	F.T. from their table. Do not accept $-7(^{\circ}C)$ .
5. $55 \times (\text{f})1.24$ OR $55 \times 124(\text{p})$	M1	
$(\pounds)68.2(0)$ OR $6820(p)$	A1	
$181 \times (\pounds)0.08$ OR $181 \times 8(p)$	M1	
(£)14.48 OR 1448(p)	A1	
(Water Charge =) $(f)$ 82.68 OR 8268(p)	A1	F.T. their amounts only if using consistent units.

JUNE 2012	Mark	FINAL MARK SCHEME
	N/1	Comments
6. (Hire of hall) $4 \times (t) 20$		
$= (\mathfrak{x}) \delta 0$ (Total cost -) (f)230		$E T = 150 \pm \text{'their } 80^{\circ}$
$(10tar \cos z) \qquad (1230)$	M1	r.1.130 + then 80.
$(Income -) \qquad (f)640$		
$(\text{Income}_{-})$ $(z)040$	AI	
(Profit -) (f)640 - (f)230	M1	FT their values
(110111 -) (1)040 - (1)250 - Profit of (f)/10	Δ1	Must indicate 'Profit' ( or 'Loss' if so on F T )
= 11010 of ( $z$ )410	711	Must indicate 11011t (of 1055 1150 011.1.).
Look for	OWC	OWC2 Presents relevant material in a coherent and logical
• spelling	2	manner, using acceptable mathematical form, and with few
<ul> <li>clarity of text explanations,</li> </ul>	_	if any errors in spelling, punctuation and grammar.
• the use of notation (watch for the use of '=', £ being		
appropriate)		OWC1. Presents relevant material in a coherent and logical
		manner, but with some errors in use of mathematical form,
QwC2: Candidates will be expected to		spelling, punctuation or grammar.
• present work crearry, with words explaining process		OR
AND		Evident weakness in organisation of material but using
• make few if any mistakes in mathematical form,		acceptable mathematical form, and with few if any errors in
spelling, punctuation and grammar and include units		spelling, punctuation and grammar.
in their final answer		
QWC1: Candidates will be expected to		QWC0. Evident weakness in organisation of material and
• present work clearly, with words explaining process		errors in use of mathematical form, spelling, punctuation
OR		and grammar
<ul> <li>make few if any mistakes in mathematical form.</li> </ul>		
spelling, punctuation and grammar and include units		
in their final answer		
7 (a) Plotting all three points correctly	D2	D1 for 2 correct plots A correct line implies D2
<i>I ine drawn through their points</i>		F T their three plots. A context line implies F 2.
Ente drawn through their points.	LI	not gained
(h) 32	B1	ET their line Allow $\pm \frac{1}{6}$ 'small square'
(0) 32.	21	1.1. then fine. Anow $\pm 72^{\circ}$ small square .
(c) $18(^{\circ}C)$ AND a clear reason given.	B1	Some <b>correct</b> use of their graph required
		For an accurate graph (or no graph) 18°C needs to be
		equated to $64^{\circ}$ F to $65^{\circ}$ F OR $60^{\circ}$ F needs to be equated to
		$15^{\circ}$ C to $16^{\circ}$ C.
		Do not accept 'its higher on the line' unless their line has
		been clearly marked at 60°F and 18°C.
8. (a) (Area = ) $1.4 \times 0.8$	M1	
$= 1.12  (\text{km}^2)$	A1	
8. (b)		Use overlay.
		Do not penalise those who use their own point A.
Position of point B due east of point A.	B1	Allow $\pm 2^{\circ}$ .
AB = 10 cm, $AC = 6$ cm and $BC = 7.5$ cm.	B3	B1 for each correct length. Allow $\pm 2$ mm.
		There is no requirement to join the points together.
		Treat a <u>consistent</u> use of a different scale as a misread.
9. (a) $800 \times 1.57$	M1	
= (\$)1256	A1	
9. (b) (Cost of coat =) $199 \div 1.57$	M1	
= (£)126.7(5)	A1	
(To nearest pound =) $(\pounds)127$	A1	F.T. their amount.

Image: Constant of the point of the poin	and
(b) $(0 \times 3) + 1 \times 4 + 2 \times 2 + 20 \times 1$ (28) $\div 10$ (Where $\pm 10$ And $\pm 10$ (Where $\pm 10$ (Where $\pm 10$ and $\pm 10$ (Where \pm 10 (Where $\pm 10$ (Where $\pm 10$ (Where $\pm 10$	and
(b) $(0 \times 3) + 1 \times 4 + 2 \times 2 + 20 \times 1$ (28) $\div 10$ M1 For the intent to multiply values by their frequencies then add.	s and
÷ 10 m1	
= 2·8 A1	
(c) A valid reason given e.g. M1	
'Only one worker was absent for more than 2.8 days'. Do not accept e.g. '2.8 is not a full day' or 'It is simp	pler'
'Most workers were absent for 0,1 or 2 days'. or 'It is more accurate' or 'It is clearer', <u>unless</u>	
Applies to the majority'. Most common one'. $(The)$ Mode	
If 'Mean' chosen then M0A0 whatever reason given	
11. Sight (time taken) 2hrs 30min or $2.5$ (hrs) B1 Allow 2:30, 2.30, 2.30 and $2.3$ (0). Also allow 150(m	111).
(Speed km.ph) $172/2.5$ M1 F.T. 'their time taken' in hours. Use of 2.3 is M1A0 (	(but
does imply previous B1).	
= 68.8 (k.p.h) A1 Ignore incorrect units at this stage.	
$68 \cdot 8 \times 5$ M1 F.T. their speed in km.ph.	
8 Allow M3 for $172/2.5 \times 5/8$ .	
= 43 (mph) A1 F.T. answers should be accurate to at least 1d.p.	
Sight (time taken) 2hrs 30min B1	
$172 \times 5/8$ M1	
=107.5 A1	
107.5/2.5 M1 F.T. 'their 107	1.5'
$= 43(mph) \qquad A1 \qquad and 'their times and $	me'.
12. Three different valid comments.	
$e_{\sigma}$ 'Not representative of population'	
'biased' (by age, gender or interest group). Do not giv	ive
more than one mark for similar criticism(s).Reference	e to
location should only be credited once.	
'A leading question', (What is meant by tee much?'	
What is meanined by too much? (Chucisms of question (1))	
'Asking an opinion (not fact)'	
'Does not specify over what period of time', 'is it per night or per week?' (a criticism of question (	(ii))
'Does not specify at what time (night or day)'	
Better with tick boxes'.	
'Might get a poor response' 'people will forget or not bother (to post or complete	•
them )'	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	
Sight of (£)1.60 (single ball in the box)	
(Difference is using ) (f)( $\sim$ OD = 40( $\sim$ ) D1 = DT (1-1) = (1-1)	
(Difference in price =) $(t)b$ OK $40(p)$ B1 F.1. their amounts.	
Use of $\frac{6}{10} \times 100$ OR $\frac{40}{100} \times 100$ M1 F.T. their price difference.	
$30 - 20(\%)$ $\Delta 1$	

### UNIT 1 (HIGHER TIER)

JUNE 2012 UNIT 1 Higher	Mark	FINAL MARK SCHEME Comments
1. (a) Valid reason, e.g. 'only those interested in drama will be leaving the theatre', 'Q3 assumes you won't return'.	B1	Accept reference to location or to Q3 Ignore additional information given by candidates once a correct response has been given credit.
<ol> <li>(b) (i) / (ii) Any reference to two of the following.</li> <li>'50 appears in two boxes' 'no over 75 box'</li> <li>'people might object to giving their age', 'too personal'.</li> </ol>	B1 B1	Ignore additional information given by candidates once a correct response has been given credit. Do not accept 'not relevant' or 'different age gaps'.
1.(c) Valid reason, e.g. 'asks the same thing twice', 'vague', 'difficult to collect responses', 'people have to write answer', 'better to have tick boxes', 'biased', 'negative', 'leading question', 'taken for granted you won't return	B1	Ignore additional information given by candidates once a correct response has been given credit.
2. Sight of $9745 \times 2.12$ OR $90 \times 12.4$ (£)206.59(4) or 20659(.4)(p) (£)11.16 or 1116(p) (Cost without VAT) (£)217.75(4) or 21775.4(p)	M1 A1 A1 A1	Accept (£)206.60 or 20660(p) . Do not accept incorrect units but do allow £206.59p and £11.16p. F.T. 'their two amounts'.
(Bill =) $217.75 \times 1.05$ or equivalent = (£)228.64 or 22864(p)	M1 A1	F.T. 'their cost' in $\pm$ s or in pence. Allow $\pm$ 1p but answer must be a whole number of pence.
<ul> <li>Look for</li> <li>spelling</li> <li>clarity of text explanations,</li> <li>the use of notation (watch for the use of '=', £, % being appropriate)</li> <li>final answer in £</li> </ul>	QWC 2	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.
<ul> <li>QWC2: Candidates will be expected to <ul> <li>present work clearly, with words explaining process or steps</li> </ul> </li> <li>AND <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> </ul> </li> <li>QWC1: Candidates will be expected to <ul> <li>present work clearly, with words explaining process or steps</li> </ul> </li> <li>OR <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> </ul> </li> </ul>		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 weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar
3. Sight (time taken) 2hrs 30min or 2.5(hrs) (Speed km.ph) 172 / 2.5 = 68.8 (k n h)	B1 M1	Allow 2:30, 2.30, 2.30 and $2 \cdot 3(0)$ . Also allow 150(min). F.T. 'their time taken' <u>in hours</u> . Use of $2 \cdot 3$ is M1A0 (but does imply previous B1).
$68.8 \times \frac{5}{8}$ = 43 (mph)	M1 A1	F.T. their speed in km.ph. Allow M3 for $172 / 2.5 \times 5/8$ . F.T. answers should be accurate to at least 1d.p. Alternative method. Sight (time taken) 2hrs 30min. B1 $172 \times 5/8$ M1 =107.5 A1 107.5 / 2.5 M1 F.T. 'their $107.5$ ' = 43 (mph) A1 and 'their time'

JUNE 2012	Mark	FINAL MARK SCHEME
UNIT 1 Higher		Comments
4. Attempt at $\sum \mathbf{f} \times \mathbf{x}$ (8200000) Division by $\sum \mathbf{f}$ (25000)	M1	
Division by $\sum f$ (25000)	mı	
(Mean cost =) $(\pounds)328$	A1	C.A.O.
5. 17.7	B2	B1 for 17.73(22) B1 for 17.70
6. Sight of (£)30 (15 individual balls) OR	B1	
Sight of $(\pounds)1.60$ (single ball in the box)		
(Difference in price =) $\pounds 6$ OR $40(p)$	B1	F.T. their amounts.
Use of $\underline{6} \times 100$ OR $\underline{40} \times 100$ $30$ OR $\underline{40} \times 100$	M1	F.T. their price difference.
= 20(%)	A1	
7. $100 = 20 \times 4 + \frac{1}{2} \times a \times 4^2$ .	B1	For correct substitution.
$a = \frac{100 - 20 \times 4}{4^2} \times 2$	B1	Allow for correct intent.
$= 2.5 \ (ms^{-2})$	B1	C.A.O. Accept an embedded answer.
8. (a) Appropriate uniform scale on vertical axis.	B1	Must allow for all plots up to 6 hours. Need not start at 0.
Line starts at (0, 200).	B1	Accept plot at (0,200) if no line drawn.
Straight line with correct gradient (150 <i>l</i> /h).	B1	
(b) 620(litres)	B1	F.T. their graph $\pm \frac{1}{2}$ 'small square'.
9. Sight of 4913.	B1	
(Volume of metal removed) $\pi \times 4^2 \times 17$	M1	
$= 854(.5)(cm^{3})$	A1	Accept 853 to 856 inclusive OR $272\pi$ .
(volume of part =) 4913 - 854.5	M1	F.T. 'their two derived volumes'.
= 4058(.5)	A1	
10. (a) Least length $= 4.45$	B1	
Greatest length $= 4.55$	B1	Accept 4.54999recurring.
(b) Greatest length = $41 \times 4.55$	M1	F.T. 'their greatest cube' only if $> 4.5$ . Ignore other multiplications seen.
= 186.55(cm)	A1	
Indicates that 'smallest shelf' is 185(cm)	B1	
A statement that the cubes will not fit	E1	This mark is dependent on M1 gained.
		F.T. logical statement.
		<i>Look out for logical thinking when working with values</i> other than 4.55 and/or 185. Some, or possibly all, of the
		marks available in part (b) may be gained.
		Values must remain consistent with the shelf not always
		being long enough for the award of the E1 mark.
		<u>Alternative method</u>
		Smallest shelf' = 185(cm) B1
		$\begin{bmatrix} 185/4.55 \\ -40.6( ) \end{bmatrix} = \begin{bmatrix} MI \\ AI \end{bmatrix}$
		= 40.0() Clear explanation that $40.6 < 41$ and so cubes E1
		are not certain to fit
		Alternative method
		Smallest shelf' = 185(cm) B1
		185/41 M1
		$= 4.51(\dots) \qquad AI$
		Clear explanation that $4.51 < 4.55$ and so cubes E1 are not certain to fit

JUNE 2012	Mark	FINAL MARK SCHEME
UNIT 1 Higher		Comments
11 $104\% \equiv (\pounds)884$	B1	Accept any indication.
(Original investment) $\underline{884} \times 100$	M1	
104		
= (£)850	A1	
12. $4 \div 3$ OR $4 \times \frac{1}{3}$	M1	
$\times 2\frac{1}{2}$ OR equivalent	M1	
= $20/6$ (hrs) or equivalent OR $3.33()$ (hrs) OR $200$ (min)	A1	Do not accept 20÷6 until it is evaluated.
3hrs 20min	A1	F.T. if at least one M1 and of equivalent difficulty.
		If question is misread as 'It took Machine A 4 hours
		How long did it take Machine <b>B</b> ?' award
		SC1 for $(4 \times 3) / 2\frac{1}{2}$ or 4.8 hours and a further
		SC1 for 4hrs 48min.
13 (a) Sight of (angle DAE = ) $70^{\circ}$ .	B1	Seen or implied in calculations or on the diagram.
(length of arc DE =) $70/360 \times 2 \times \pi \times 10$	M1	F.T. 'their 70°'
12.2()	A1	
Perimeter = $62 \cdot 2(\dots)(m)$	A1	Their 12.2 + 50
(b) (area of rectangle =) $150(m^2)$	B1	
(area of sector =) $70/360 \times \pi \times 10^2$ (61.08)	M1	F.T. 'their 70°' BUT must be the same as for (a).
Area of land = $211(\cdot 08)(m^2)$	A1	
14. (Volume of cone) $\frac{1}{3} \times \pi \times 19 \cdot 8^2 \times 15$	M1	
$= 6158(.14)(\text{cm}^3)$	A1	Accept answers between 6155 and 6161.
'7 litre' or 7000(cm <sup>3</sup> ) (hemisphere required)	B1	F.T. their volume in cm <sup>3</sup> .
$2/3 \times \pi \times r^3 = 7000$	M1	F.T. their volume in cm <sup>3</sup> if not whole litre.
$r^3 = \frac{7000 \times 3}{(3342)}$	m1	
$2  imes \pi$		
r = 14.95()(cm)	A1	Accept to 1dp but may lose final A1.
(Diameter = ) $29.9$	A1	F.T. $2 \times$ 'their radius' to nearest mm. Pre approximation
		of their radius may result in A0.
		If $4/3\pi r^3$ used allow
		SC1 for $r = 11.86()$ and a further
		SC1 for $d = 23.7$

#### **UNIT 2 (FOUNDATION TIER)**

JUNE 2012		FINAL MARK SCHEME
UNIT 2 (Non calculator) Foundation	Marks	Comments
1. (a) (i) Seven thousand and eighty nine	B1	
1. (a) (ii) 37204	B1	
1. (b) 815	B1	
1. (c) 568	B1	
1. (d) 600 or 6 hundred OR hundred(s)	B1	
1. (e) e.g (68, 69 or 70 × 10 or 11) OR 68.9 × 10 680 OR 690 OR 700 OR 770 etc	M1 A1	Good estimates F.T their estimates for simple calculations M0, A0 for actually calculating $68.9 \times 11$ (757.9) Unsupported answers get M0, A0.
1. (f) 1, 3, 9, 27	B2	B1 for any 2 or 3 with no incorrect OR all 4 correct and one incorrect
2. 80g 800kg 80mg 80kg	B1	
270mm 270cm 270m 270km	<b>B</b> 1	
170cm 17m 170mm 1700cm	<b>B</b> 1	
27 litres $(270 \text{ ml})$ 2.7 cm <sup>3</sup> 2700litres	B1	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	B1 B1 B1	Allow 1, 2 and 3 to represent A, B and C respectively. Allow 6/10 and 3/10 to represent A and C respectively. A should be between ½ exclusive and ¾ inclusive (up to the end of 'it.') B should be at 1. C should be between ¼ inclusive (beyond the end of 'that') and ½ exclusive.
3. (b) unlikely	B1	
4. (a) (i) Add 14 to the previous term	B1	Accept +14 Do not accept '2 multiples of 7' or 'two 7s' Do not accept n + 4
4. (a) (ii) Multiply the previous term by 2	B1	Accept $\times 2$ or 'double' Do not accept n $\times 2$
4. (b) 5	B1	Do not accept $5 \times 5$
4. (c) $60/100 \times 70$ = 42 I.S.W.	M1 A1	Any correct method for finding 60% A0 for 42%.
4. (d) Strategy for finding how many 85p in £10 11 (and (£)9.35) 65p change	M1 A1 B1	10 is £8.50, 11 is 9.35, (12 is 10.20) For 11 and (£)9.35 OR 11 and no incorrect working. F.T. if possible
QWC on the next page		

JUNE 2012		FINAL MARK SCHEME
UNIT 2 (Non calculator) Foundation	Marks	Comments
4. (d) continued		
QWC Look for Spelling Clarity of text explanations The use of notation – watch for '=','£', 'p' being used appropriately. QWC2: Candidates will be expected to present work clearly, with words explaining their processes 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 their processes or steps OR make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC 2	<ul> <li>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.</li> <li>QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar.</li> <li>OR</li> <li>Evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.</li> <li>QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling</li> </ul>
5. A $(4, -3)$ $(4^{th} quadrant)$ B $(-2, 0)$ $(x - axis, left of O)$ C $(-3, -2)$ $(3^{rd} quadrant)$	B1 B1 B1	Reversed coordinates gets B0 each time.
6. Overall strategy including triangle is isosceles	M1	Look at diagram also
Top angle = $40$	A1	
x = 360 - 90 - 90 - 40 - 140	M1	F.T. 'their 40'except 90°.
- 140	AI	
7. (a) (i ) (£) 6m	B1	Ignore $\pounds$ s. Allow $6 \times m$ or $m \times 6$ or $m6$
7. (a) (ii) $x - 4$ (kg)	B1	Ignore kg. Allow $xkg - 4kg$ , and $y = x - 4$
7. (b) -2	B2	B1 for $-14$ B0 if x and/or y still left in their answer, e.g. $-14x + 12y$
7. (c) $5x = 20$ x = 4	B1 B1	Isolating the 5x F.T. ax = b ( $a \neq 1$ ) Accept embedded answers, e.g. $5 \times 4 - 3 = 17$
7. (d) $(n-4)/6$ OR $\frac{n-4}{6}$	B2	B1 for $n - 4$ OR B1 for a linear expression in n divided by 6 including $n - 4 \div 6$ , OR $n - 4 / 6$ but not $n - 4/6$ $n - 4 = -4n \div 6$ gets B1 for sight of $n - 4$ $-4n \div 6$ gets B1 for linear expression in n divided by 6 Ignore n= at the start and =n at the end of their work.

JUNE 2012	Monka	FINAL MARK SCH	IEME
UNIT 2 (Non calculator) Foundation	Marks	Comments	
8. (a) Completed ball numbers and disc colours	B1		
yellow 1 3 5 7 (green) 1 3 5 7 blue 3 9 15 21 (red) (3) 9 (15) 21 (1) 3 (5) 7	B2	B1 for 2 or 3 correct columns OR 2 o	r 3 correct rows.
8. (b) (i) 6/16 I.S.W. OR exact decimals or %s, 37.5% or .375	B2	F.T. their table B1 for a numerator of 6 in a fraction less than 1. B1 for a denominator of 16 in a fraction less than 1. Do not penalise incorrect reduction of fractions.	NOTES Penalise –1 for use of words such as "6 out of 16", "6 in 16" OR "6:16". When fraction and wrong notation seen, DO NOT penalise wrong notation.
8. (b) (ii) 10/16 I.S.W.	<b>B</b> 1	F.T. 1– 'their (b)(i)' if a fraction $< 1$ B0 if the incorrect reduced fraction fr	OR F.T. their table
0 (a) Attempt to use 8:38 + 6 hours 34 minutes	M1	Sight of 14.72 or 3.12 implies M1	$\frac{1}{13} \frac{1}{13} \frac$
$(a)$ Autempt to use $6.56 \pm 6$ hours 34 minutes	1011	Signt of 14 72 of 5 12 implies with	Accept 8.38 + 0.34
15:12 or 3:12pm	A1	Accept 15 12 pm. A0 for 3:12 OR 15 Answers of 3hours 12 mins or 15 hou M1, A0	5:12 am rs 12 mins implies
9.(b) Time difference 8 hours (0)1:05 or 1:05 (a.m.) AND Wednesday	B1 B2	Implied by an ans. of 25:05, or 00 65 FT through 'their time difference' + 1 and $\leq$ 10, and correctly evaluated Allow 1 05 or 1.05 AND Wednesday B1 for (0)1:05 or 1:05 (a.m.) or 1 05 B1 for Wednesday and time 01:05pm	or attempt $17:05 + 8$ 17:05 provided $\geq 6$ or 1.05
10. (Auto marked) C, B, D	B3	With no other entries	
		With no other entries With no other entries	
11. Correct reflection in the x-axis	B2	B1 for a reflection in the y-axis or in	any line indicated
(maybe implied by final answer)			
Correct rotation of their reflection	B2	FT their reflection provided it is unar identifiable.	nbiguously
		B1 for anticlockwise rotation through triangle A through 90° clockwise ind Any sight of rotation in all 4 quadran	90° OR rotation of icated as triangle C ts, then no marks

JUNE 2012	Marks	FINAL MARK SCHEME
UNIT 2 (Non calculator) Foundation		Comments
12. (USBs cost £)6000	B1	
(Webcams takings) (£)990	B2	B1 for sight of 33 or 330 or 660 or 22×1.50×30 or
Or sight of 660+330 (may be in different stages of		$22 \times 30 + \frac{1}{2}$ 'their 22×30' or equivalent calculation
working)		
$(\text{USB profit} =) 7590 - 990 - 6000 (= \pounds 600)$	M1	Do not accept 330 or 660 as their 990
		FT 7590 - their 990 - their 6000
(USB profit is) 10%	A1	FT (their USB profit/ their 6000) $\times$ 100
		Alternative:
		B2 (Webcams takings $30 \times 33 = \pounds$ )990
		(or B1 for sight of 33 or 660 or 22×1.50×30 or
		equivalent calculation)
		B1 (USB takings 7590 – 990 =) 6600
		M1 (Selling price each USB) $6600 \div 120 (= \pounds 55)$
		A1 (USB profit) 10%
		Unsupported 10% gets all 5 marks

### UNIT 2 (HIGHER TIER)

JUNE 2012		FINAL MARK SCHEME
UNIT 2 Unitised Higher Tier		Comments
1.(a) Attempt to use 8:38 + 6 hours 34 minutes	M1	Sight of 14 72 or 3 12 implies M1. Accept '8.38 + 6.34'
or $13: 38 - 5 + 6$ hours 34 minutes		
15:12 or 3:12pm	A1	Accept 15 12 pm. A0 for 3:12 or 15 12 am
		Answers of 3hours 12 mins or 15 hours 12 mins implies M1, A0
1.(b) Time difference 8 hours	B1	Implied by an answer of 25:05, or 00 65 or attempt $17:05 + 8$
(0)1:05 or 1:05 (a.m.) AND Wednesday	B2	FT through 'their time difference' + 17:05 provided $\geq 6$ and $\leq 10$ ,
		and correctly evaluated
		Allow 105 or 1.05 AND Wednesday
		B1 for (0)1:05 or 1:05 (a.m.) or 1 05 or 1.05
	DA	B1 for Wednesday and time 01:05pm
2.(a) 26, 29, 34	<b>B</b> 2	B1 for any 2 correct terms in the correct position, or 25,26,29 or $1^2$ , 25, $2^2$ , 25, 25, 25, 25, 25, 25, 25, 25, 25, 25
		1+25, 2+25, 3+25
2.(b) 63	B2	B1 for evidence of differences 1, 4, 9, 16, or statement '(goes up
		in) square numbers'
		Award B0 for n <sup>2</sup>
3. C	B1	With no other entries
B	B1	With no other entries
D	BI	With no other entries
4.(a) $40/4 = 5x$ or $5x = 10$ or $40 = 20x$ or $40 = 4 \times 5x$ or $8 = 4x$	M1	
<i>x</i> = 2	A1	Accept embedded answers. Mark final answer
4 (b) $6x - 15 > 21$ or $2x - 5 > 21/3$	B1	FT until 2 <sup>nd</sup> error Use of '=' gets no marks unless replaced in
6x > 21 + 15 or $6x > 36$ or $2x > 7 + 5$	B1	final answer, then award all 3 marks
x > 6	B1	Mark final answer. Must be a simplified answer
		If working shows $6x - 15 > 21$ then $6x > 6$ and then $x > 1$
		award B1, B0, B1
		2x-5>21 is 2 errors, hence B0
4.(c)		FT until 2 <sup>nd</sup> error, equivalent level of difficulty
$3g^2 = f$	B1	Accept $3g^2 = f + 0$
$g^2 = f/3$	B1	Accept inclusion of ±0
$g = (\underline{+}) \sqrt{(f/3)}$	B1	Square root clearly needs to include the /3, and accept inclusion
		of ±0
		Do not accept 0f instead of $0+f$
		$9g^2 = f \text{ is } 1 \text{ error, first } B0 \text{ then } FT$
5.Correct reflection in the x-axis	B2	B1 for a reflection in the y-axis or in any line <u>indicated</u>
Correct rotation of their reflection	R2	FT their reflection provided it is unambiguously identifiable
	102	B1 for anticlockwise rotation through 90° OR rotation of triangle
		$\Delta$ through 90° clockwise indicated as triangle C
		Any sight of rotation in all 4 quadrants then no marks
		They sight of rotation in an + quadrants, then no marks

JUNE 2012		FINAL MARK SCHEME
UNIT 2 Unitised Higher Tier	<b>D</b> 1	Comments
6. (USBs cost $\pounds$ )6000 (Webcome takings) ( $\pounds$ )000	B1 P2	P1 for sight of 22 or 220 or 660 or $22\times1.50\times20$ or
(webcallis takings) $(\pounds)$ (990) Or sight of 660+330 (may be in different stages of working)	D2	$22 \times 30 + \frac{1}{2}$ 'their 22 × 30' or equivalent calculation
(USB  profit =) 7590 - 990 - 6000 (=f.600)	M1	Do not accept 330 or 660 as their 990
(CDB prom -) (5) ( ) (CDB prom -) (5) ( )		FT 7590 - their 990 – their 6000
(USB profit is) 10%	A1	FT (their USB profit/ their 6000) $\times$ 100
		Alternative:
		B2 (Webcams takings $30 \times 33 = \pounds$ )990
		(or B1 for sight of 33 or 660 or $22 \times 1.50 \times 30$ or
		(USR takings 7500 - 900 -) 6600
		M1 (Selling price each USB) $6600 \pm 120 (- f55)$
		A1 (USB profit) 10%
Look for		Unsupported 10% gets all 5 marks
relevance	Q	QWC2 Presents relevant material in a coherent and logical
• spelling	W C	manner, using acceptable mathematical form, and with few if any
<ul> <li>clarity of text explanations,</li> <li>the use of potentiar (watch for the use of '=' f 0/</li> </ul>	2	errors in spelling, punctuation and grammar.
• the use of notation (watch for the use of -, <i>z</i> , 70 being appropriate)		OWC1 Presents relevant material in a coherent and logical
		manner but with some errors in use of mathematical form,
QWC2: Candidates will be expected to		spelling, punctuation or grammar.
<ul> <li>present work clearly, with words explaining process</li> </ul>		OR
or steps		Evident weaknesses in organisation of material but using
AND • make few if any mistakes in mathematical form		punctuation and grammar.
spelling, punctuation and grammar and include units		
in their final answer		QWC0 Evident weaknesses in organisation of material, and errors
QWC1: Candidates will be expected to		in use of mathematical form, spelling, punctuation and grammar.
<ul> <li>present work clearly, with words explaining process</li> </ul>		
or steps		
<ul> <li>make few if any mistakes in mathematical form.</li> </ul>		
spelling, punctuation and grammar and include units		
in their final answer		
7.(a) 0.3, 0.7 on all 3 sets of branches	B2	B1 for any 3 correct entries OR 1 pair correct
(b) Sight of 0.3×0.7 or 0.21	B1	FT from (a), but probability values used must $>0$ and $<1$
$0.3 \times 0.7 + 0.7 \times 0.3$	M1	Correct method with addition of the 2 products seen or implied
= 0.42	Al	Mark final answer
8.(a)		B2 for 6, 7 or 8 correct entries, including FT values and
(14/20) 22/40 36/60 52/80 62/100	B3	calculations, or
0.7 0.55 0.6 0.65 0.62		B1 for 4 or 5 correct entries, including FT values and calculations
(b) 0.62 or equivalent	B1	FT their final column entry in (a)
Reason, e.g. "last value". "most throws"	E1	Do not accept 'most accurate'. Mark independently of B1
		If no estimate given, but statement that 100 throws as more
		results then award B0, E1
(c) Conclusion e g "settle" "stable" "smooth out" "would	E1	Do not accept implication that it stays at 0.62
get a more accurate answer"		
(d) 1-0.62 or $1-62/100$	M1	FT 1 – (b), or 1 – 'their final result in the table in (a)' Ignore incorrect cancelling
0.38 or 38/100 (=19/50)	AI	
	1	

JUNE 2012		FINAL MARK SCHEME
UNIT 2 Unitised Higher Tier		Comments
9. Sight of, or calculations that imply knowledge of facts 10mm = 1cm and 100cm = 1m, or 1000mm = 1m, or equivalent combinations that could lead to a correct conversion	B1	
$9 \times 10^{-5}$ (m)	B2	B1 for 0.00009 or $0.09 \times 10^{-3}$ or equivalent
		<i>SC1 for their value &gt;0 and &lt;1 correctly expressed in standard</i>
		form with power of 10 negative. First B1 may also be awarded if
	D.	appropriate
10.(a) Any 2 of the lines $x+y=8$ , $5x+y=10$ and $2y-x=4$ drawn	<b>B</b> 2	BI for any I line correct
Correct region identified	B1	CAO
	51	
(b) x and y selected within their region	B1	Not on the lines. FT their identified region.
		If a closed region is formed but not shaded, accept a point within
		the inclusion of axes. Not for a non identified open region via
		extension of the graph paper
	<b>D1</b>	If no region selected accept any possible correct points, e.g. (2, 4)
11.(a) $40^{\circ}$	BI E1	Dependent on R1, unless correct workings seen but with 1 error
Angle at the centre is twice the angle at circumference	EI	in their calculation
(b) 140°	B2	FT their <boc, (180="" +="" -="" 2="" 90,="" <boc)="" i.e.="" provided="" td="" unambiguous<=""></boc,>
		B1 for finding $\langle OCB = 50^{\circ} \text{ or } \langle BCT = 40^{\circ} \text{ may be seen on the} \rangle$
Circle theorem description e.g. Redius mosts tangent at 00° or	E1	diagram.
Alternate segment theorem	EI	Dependent on B2, unless correct workings seen but with 1 error in their calculation
		FT from their (a)
12.(a)Points		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	B1	
$\begin{array}{ c c c c c c c c } \hline y=2^{2} & (\frac{1}{4}) & \frac{1}{2} & 1 & (2) & (4) \\ \hline Suitable choice of avec through the origin and uniform scales \\ \hline y=2^{2} & (\frac{1}{4}) & \frac{1}{2} & 1 & (2) & (4) \\ \hline y=2^{2} & (\frac{1}{4}) & \frac{1}{2} & 1$	B1	Axes must be clear, but may not be labelled
x from -2 to 2 and v from 0 to 4	DI	Thes must be clear, but may not be labelled
Plotting all 5 points correctly and joining with a curve	B1	(FT their evaluations of y if shown)
		F1 from their points and the three given point
		Do not FT scales, where the scale is < 1cm representing 1 unit
(b) Reading from their graph for y=3	B1	FT their curve, or their graph provided the points are joined
		Tolerance for accuracy, within 1 small square
(c) Reading their graph for $y = 0.5$	B1	FT their curve, or their graph provided the points are joined
(c) Reading then graph for $x = 0.5$	DI	Tolerance for accuracy, within 1 small square
13.(a) Correct sketch (shift up)	B1	
(0, 3) indicated on the correct sketch	B1	Depends on the first B1. Dashes to indicate '3 notches' is
12 (b) Correct skatch (shift to left)	D1	insufficient
(-3, 0) indicated on the correct sketch	B1 B1	Depends on the first B1.
<b>OR</b> (0, 9) indicated on the correct sketch		

#### **UNIT 3 (FOUNDATION TIER)**

JUNE 2012	Marks	FINAL MARK SCHEME
UNIT 3 (Calculator allowed) Foundation Tier	D1	Comments
1. (a) $66.48$ (plants)	BI	
79.8(0) (roses)	BI D1	
49.92 (compost)	BI	
106 2(0)	D1	ET their figures for 1 error
190.2(0)	DI	F.1. then figures for 1 effor Unsupported 106 $2(0)$ gets $\mathbf{R}^{4}$
$(1, (b), (i), 10 \times 5)$	M1	Any valid method
1. (0) (1) $19 \times 3$ = 05 (reward points)		E T their total
= 95 (reward points)	AI	Unsupported 95 gets the M1 $\Delta 1$
		SC1 for 85 ET their $(6+7+4)\times 5$
		OR FT 'their tens 190' from part (a) $\div$ ?
1 (b) (ii) (f) 3 8(0)	B1	F T their total
1 (c) (i) 16800	B1 B1	
1 (c) (ii) 17000	B1	
$\frac{1}{1}$ (d) 46	B1 B1	B0 for 46 0 or 46 00
1.(a) + 0 1.(e) + 0 + 12	M1	Correct substitution
= 52	A1	
2 (a) 8 6 12 14	B2	B1 for any two/three correct frequencies
2. (a) 0 0 12 14	D2	If frequencies score 0, then give B1 for all 4 correct
		tallies
2, (b) 4 OR Sky	B1	E.T. their table of frequencies
	51	B0 for 14, but B1 for 4 (or Sky) and 14
2. (c)		
Both axes labelled, e.g. frequency along one axis and	B2	B1 if no scale, but allow one square to represent 1
BBC1 (1), BBC2 (2), ITV (3), SKY (4) along other axis		OR B1 if not labelled as 'frequency' or similar.
anywhere within the base (inc.) of the corres. bar.		If frequency scale starts with 1 at the top of the first
and uniform scale for the frequency axis starting at 0 and		square the starting at 0 will be implied for this axis.
labelled 'frequency' OR 'Number'.		
		F.T. their table of frequencies
Four bars at correct heights (bars must be of	B2	B1 for any 2 or 3 correct bars on F.T.
equal width)		Bars must have same width
3. Evidence of square counting	M1	
48 - 52	A1	Numbers in this range get the M1, A1
240 - 260	B1	F.T. $5 \times$ 'their area'
		Numbers in this range get the 3 marks
4. Des l'accet de se la 6 de se de 1 - 24297		
Reading at the heating in a of the 24387		
Reading at the beginning of the 23754	D1	CAO
Period Number of units used 622	DI M1	C.A.U. E.T. their number of units
Number of units used $055$		$\Gamma$ . 1. men number of units Must be in fs for the A1
101 28	R1	OR for 2700 if working in pence
Charge: 30p per day for 90 days 27.00	B1	F T their figures
Total cost 128.28	DI	1.1. tion figures.
5. (a) Angle BAC $(40^\circ)$	B1	Allow $+ 2^{\circ}$
Angle ABC (76°)	B1	Allow $\pm 2^{\circ}$
Completed triangle	B1	Only if at least one angle correct.
1 ··· C ·		Complete reflection of the triangle gets B2
5. (b) Two appropriate arcs	M1	Allow construction of $60^{\circ}$ at the other end of the line
		for M1 and A1
Angle of 60°	A1	Allow ± 2 °
5. (c) Intersecting arcs of equal radii above and below	M1	
the given line.		
Line bisector	A1	

ConventsConverting all 7 numbers46(a) 18 25 37 42 53 62 71M147A1For advision by 7 of a number in the range 240–39048(b) Sum 07M145A1For advision by 7 of a number in the range 240–3906(c) 5 33B17. (a) 547B27. (a) 547B28. (a) 34 (miles)B18. (a) 44 (minutes)B18. (a) 44 (miles)B18. (a) 44 (miles)B18. (a) 44 (minutes)B19. Angles are 144°, 96°, 78° and 42°2. angles correct and correctly labelled.B40. and angles correct and correctly labelled.B40. and angles correct and correctly labelled.B40. Correct ind correct had correctly labelled.B40. Correct ind correct y labelled.B40. Total cost of carrots $-427, 63^-, 12.6 \times 1.85$ M1(c) Correct ind correct y labelled.B10. Total cost of carrots $-427, 63^-, 12.6 \times 1.85$ M1(c) Correct ind correct y labelled.B10. Total cost of carrots $-427, 63^-, 12.6 \times 1.85$ M1(c) Correct ind correct planations(c) Correct ind correct planations	JUNE 2012	Marks	FINAL MARK SCHEME
6. (a)18253749A1For ardivision by 7 of a numbers6. (b)Sum of the numbers (315) Sum 7M1For at alwision by 7 of a number in the range 240-390 CA.O. (25 + 49 + 62 + 18 + 53 + 37 + 71)/7 gets M1,m16. (c)53B17. (a)5.47B28. (a)34 (miles)B18. (a)34 (miles)B18. (a)54 (miles)B18. (a)50 (miles)B19. Angles are 144°, 96°, 78° and 42° 2 angles correct, labels not fully correct. 1 angle correct in derawn to (118, 17:24)B19. Angles are 144°, 96°, 78° and 42° 2 angles correct, labels not fully correct. 1 angle correct in derawn to (118, 17:24)B19. Angles are 144°, 96°, 78° and 42° 2 angles correct, labels not fully correct. 1 angle correct ind correctly labelled. Correct fue derawn to (118, 17:24)B19. Angles are 144°, 96°, 78° and 42° 2 angles correct in decorrectly labelled. Correct fue degram, and all the angles correct in decorrectly labelled. Correct fabels is enough.Correct labels is enough.10. Total cost of carrots = C27.63 - 12.6 × 1.85 Their guest per values of fue diagram, and all the marded to sec if the M1 and the A1 can be arards. (C2) Caldidates will be expected to enough (02) (03) (03) (C2) caldidates will be expected to enough with work explaining their processes or stepsM1 A1 M1 M110. Total cost of carrots = C27.63 - 12.6 × 1.85 Their guest per function and grammar and include with or in any errors in spelling, punctuation and grammar and include out in their final answer processes or stepsM1 M1 M1 M1	UNIT 3 (Calculator allowed) Foundation Tier		Comments
A9A1For attempt to add the numbers6 (b) Sum of the numbers (315) Sum/7m1For a division by 7 of a number in the range 240–390 C.A.O. (25 + 49 + 62 + 18 + 53 + 37 + 71)/7 gets M1,m16 (c) 53B17. (a) 547B2B1 for 546(684430) All places given must be correct rounded or truncated B1 for 18/198001(07) All places given must be correct rounded or truncated B1 for 18/198001(07) All places given must be correct rounded or truncated B1 for 18/208. (a) 44 (miles)B18. (a) 44 (miles)B18. (a) 44 (miles)B19. Angles are 1447; 967, 78° and 42° $\Delta$ B C D10. Correct line drawn to (118, 17:24)B19. Angles correct, labels not fully correct. 1 angle correct and correctly labelled. 2 angles correct, labels not fully correct. 1 angle correct and correctly labelled. Correct labels (Words NOT the frequency OR angle), 3 or 4 angles correct and correctly labelled. B10R 11 for 0R 1 for their diagram or no diagram, 360/240. Look for the angle 1447, 967, 78° and 42° calculated correct or the start of the frequency OR angle), 3 angles correct and correctly labelled. B10R 11 for 0R 1 for their diagram or no diagram, 360/240. Look for the start and correctly labelled. Correct fabels (Mord 1 and the A1 can be awardad. (1 is) 1½° gets the M1. (OR CI for the diagram, and all the angles given correct prometizes and the method to see if the M1 and the A1 can be awardad. (1 is) 1½° gets the M1. (OR CI for all correct preentages: 40, 267, 21-7, 11.710. Total cost of carrots = £27,63 - 12.6 × 1.85 (Carrots of the respected to present work clearly, with words explaining their processes or s	6. (a) 18 25 37 <u>49</u> 53 62 71	M1	For ordering all 7 numbers
b. (b) Sum of the numbers (315) Sum of the numbers (315) Sum of the numbers (315) Sum of the numbers (315) MI 45 6. (c) 53 7. (a) 547 7. (a) 547 7. (b) 18.20 8. (a) 24 (miles) 8. (a) 34 (miles) 8. (a) 34 (miles) 8. (a) 34 (miles) 8. (a) 34 (miles) 8. (a) 44 (minutes) OR 2 hours 24 minutes 8. (a) 26 (miles) 8. (a) 26 (miles) 8. (b) 50 (miles) 8. (c) 144 (minutes) OR 2 hours 24 minutes 8. (d) Correct line drawn to (118, 17:24) 9. Angles are: 144", 96°, 78° and 42° 2 angles correct, labels not fully correct. 2 angles correct, labels not fully correct. 2 angles correct and correctly labelled. 1 angle correct and correctly labelled. 1 angles correct and correctly labelled. 1 correct and correctly (b) (b) (b) (c) (b) (b) (c) (c) (c) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	49	Al	
stur / 45for a drustion by 7 of a number in the funge 240–390 C25+49+62+18+53+37+71)/7 gets M1,m16. (c) 5.3B17. (a) 547B27. (b) 1820B18. (a) 34 (miles)B18. (a) 34 (miles)B18. (a) 34 (miles)B18. (a) 547B19. (c) 144 (minutes) OR 2 hours 24 minutesB19. (c) 145 (miles)B19. (c) 146 (miles)B19. (c) 147 (miles)B19. (c) 148 (miles)B1 <td< td=""><td>6. (b) Sum of the numbers (315) Sum <math>\sqrt{7}</math></td><td>MI m1</td><td>For attempt to add the numbers</td></td<>	6. (b) Sum of the numbers (315) Sum $\sqrt{7}$	MI m1	For attempt to add the numbers
Creck (2)Creck	Sum/ /		For a division by 7 of a number in the range $240-390$
6. (c)     53     B1       7. (a)     547     B2     B1 for 5.4606844830) All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be correct rounded or truncated blocks44830 All places given must be rounded block448333 and places given must be rounded block448333 and places gi	45	AI	(25 + 49 + 62 + 18 + 53 + 37 + 71)/7 gets M1 m1
7. (a) $547$ B2B1 for $5.46(6844830)$ All places given must be correct rounded or truncated to truncated or truncated sourcet rounded or truncated sourcet rouncet rounded or truncated sourcet rouncet rouncet rouncet rounded or truncated sourcet rouncet	6. (c) 53	B1	
7. (b) 18.20       B2       B1 for 18 19(80007) All places given must be correct promded or truncated B1 for 18 19(8007) All places given must be correct promded or truncated B1 for 18 2.         8. (a) 34 (miles)       B1         8. (b) 50 (miles)       B1         8. (c) 144 (minutes) OR 2 hours 24 minutes       B1         A B C D       B1         3 or 4 angles correct and correctly labelled.       B3         3 or 4 angles correct and correctly labelled.       B3         2 angles correct and correctly labelled.       B3         3 or 4 angles correct and correctly labelled.       B3         3 ar 4 angles correct and correctly labelled.       B3         2 angles correct and correctly labelled.       B3         1 fo OR Hift for their diagram or no diagram, 360/240.       B1         Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.       B1         10. Total cost of carrots = £27.63 - 12.6 × 1.85 = (1, 4.32 OR 432(p))       M1         a (2) Cardidates will be expected to present work clearly, with words explaining their processes or steps       M1         AND       • Clarity of text explanations with sepected to present work clearly, with words explaining their processes or steps       Correct abeling, punctuation and grammar and include write work clearly, with words explaining their processes or steps       Correct abeling, punctuation and grammar.         QWC2 <td< td=""><td>7. (a) 5·47</td><td>B2</td><td>B1 for 5.46(6844830) All places given must be correct</td></td<>	7. (a) 5·47	B2	B1 for 5.46(6844830) All places given must be correct
12.2     correct rounded or truncated B1 for 18.2       8. (a) 34 (miles)     B1       8. (a) 50 (miles)     B1       8. (b) 50 (miles)     B1       A. B. C. D     Correct line drawn to (118, 17:24)       9. Angles are 144°, 96°, 78° and 42°       A. B. C. D       3 or 4 angles correct and correctly labelled.       3 or 4 angles correct and correctly labelled.       3 are 4 angles correct, labels not fully correct.       2 angles correct and correctly labelled.       1 angle correct and correctly labelled.       1 angle correct and correctly labelled.       0R       If O OR 1 for their diagram or no diagram. 360:240.       1 cok for the angles 144°, 96°, 78° and 42° calculated correctly for this M1. A1.       0R       I total cost of currots = £27.63 - 12.6 × 1.85       = (f) 4.32 OR 432(p)       Carrots cost per kg = 4.32/5.4       AND       • The use of notation watch for kg, '=','£', 'p' bring used appropriately.       0WC2 1 Craditates will be expected to expressent structuation and grammar and include units in their final answer       0WC1 Craditates will be expected to expressent steps       0WC1 Present srelevant material form, spelling, punctuation and grammar and include units in their final answer       0WC1 Presents relevant material in a coherent and logical manner. Sugai acceptable mathematical form, spelling, punctuation and grammar.       0WC1 Presents relevant material form	7. (b) 18.20	B2	B1 for 18:19(890107) All places given must be
Bit for 18.28. (a) 34 (miles)B18. (b) 50 (miles)B18. (c) 144 (minutes) OR 2 hours 24 minutesB18. (d) Correct line drawn to (118, 17:24)B18. (d) Correct line drawn to (118, 17:24)B19. Angles are 144°, 96°, 78° and 42° $\Delta$ <b>B C D</b> 3 or 4 angles correct and correctly labelled.B4 OR 3 a ref angles correct and correctly labelled.3 or 4 angles correct and correctly labelled.B4 		02	correct rounded or truncated
8. (a) 34 (mines)       B1         8. (b) 50 (miles)       B1         8. (c) 144 (minutes) OR 2 hours 24 minutes       B1         A       B       Caccept 2:24 or 2.24         8. (d) Correct line drawn to (118, 17:24)       B1       Allow ± ½ square, but line must stop at his point.         9. Angles are 144?, 96°, 78° and 42°       B1       Allow ± ½ square, but line must stop at his point.         9. Angles correct and correctly labelled.       B4       Correct labels (Words NOT the frequency OR angle).         3 or 4 angles correct and correctly labelled.       B3       Correct labels (Words NOT the frequency OR angle).         3 or 4 angles correct and correctly labelled.       B3       Correct labels (Words NOT the frequency OR angle).         3 or 4 angles correct and correctly labelled.       B3       Correct labels (Words NOT the frequency OR angle).         1 angles correct and correctly labelled.       B4       B2         1 angles correct and correctly labelled.       B4       B1         1 for ly B1 is scored for the diagram, and all the angles given correctly, then cancel the B1 and award       B1         1 Cook of the angles 144°, 96°, 78° and 42° calculated       M1       M1         1 (b) Total cost of carrots = £27, 63 - 12.6 × 1.85       M1       (£) 4.32 OR 4.32(p)         2 Carrots cost per kg = 4.32/5.4       E0 (p) OR (£) (0).8(0)			B1 for 18.2
8. (b) 50 (miles)B18. (c) 144 (minutes) OR 2 hours 24 minutesB1Accept 2:24 or 2.248. (d) Correct line drawn to (118, 17:24)B1Allow $\pm \frac{1}{2}$ square, but line must stop at his point.9. Angles are 144°, 96°, 78° and 42° 2 angles correct and correctly labelled.B4 OR 1 angle correct, labels not fully correct. 2 angles correct and correctly labelled.B4 OR B3 2 angles correct and correctly labelled.0. OR 10 OR 1 for their diagram or no diagram, 360/240. Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.M1 Hour and the method to see if the M1 and the A1 can be awarded.10. Total cost of carrots = £27.63 - 12.6 × 1.85 = (2) 4.32 OR 432(p) A1 Carrots cost per kg = 4.32/5.4 = 80 (p) OR (£) (0) 8(0) Look forM1 A1 = 80 (p) OR (£) (0) 8(0) Look for Carity of text explanations • The use of notation – watch for kg, '=', f', 'p' being used appropriately.M1 A1 Carrots clearly, with words explaining their processes or stepsAND • make few if any mistakes in mathematical form, speling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining their processes or stepsM1 A1 Carrots in mathematical form, spelling, punctuation and grammar.OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include work clearly, with words explaining their processes or stepsM1 A1 A1 A1 A1 A1 A1OR • Clarity of text explanations • The use of notation – watch for kg, '=', f', 'p' being used appropriately.M1 A1 A1 A1 A1 	8. (a) 34 (miles)	B1	
<ul> <li>8. (c) 144 (minutes) OR 2 hours 24 minutes</li> <li>B1 Accept 2:24 or 2.24</li> <li>8. (d) Correct line drawn to (118, 17:24)</li> <li>B1 Allow ± ½ square, but line must stop at his point.</li> <li>9. Angles are 144°, 96°, 78° and 42° <ul> <li><u>A</u> <u>B</u> <u>C</u> <u>D</u></li> </ul> </li> <li>3 or 4 angles correct and correctly labelled.</li> <li>2 angles correct abels not fully correct.</li> <li>2 angles correct abels not fully correct.</li> <li>1 angle correct abels of fully correct.</li> <li>1 angle correct abels of fully correct.</li> <li>1 angle correct abels of 44°, 96°, 78° and 42° calculated correctly for this M1, A1.</li> <li>OR</li> <li>ID OR 1 for their diagram, or no diagram, 360/240.</li> <li>Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.</li> <li>OR = (c) 4.32 OR 432(p)</li> <li>Carrots cost per kg = 4.32/5.4 = (c) 4.32 OR 432(p)</li> <li>Candity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2 Candidates will be expected to epresent work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>AND</li> <li>Make few if any mistakes in mathematical form, spelling, punctuation or grammar.</li> <li>QWC1 Candidates will be expected to epresent work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>Make few if any mistakes to mathematical form, spelling, punctuation and grammar and include units in their final answer must heir final ance wardet to see in organisation of material but using acceptable mathematical form, spelling, punctuation and grammar.</li> <li>OR</li> <li>OR</li> <li>Make few if any mistakes in mathematical form, spelling, punctuation and gram</li></ul>	8. (b) 50 (miles)	B1	
<ul> <li>8. (d) Correct line drawn to (118, 17:24)</li> <li>9. Angles are 144°, 96°, 78° and 42° <u>A B C D</u></li> <li>3 or 4 angles correct and correctly labelled.</li> <li>3 or 4 angles correct and correctly labelled.</li> <li>2 angles correct and correctly labelled.</li> <li>2 angles correct and correctly labelled.</li> <li>3 angles correct and correctly labelled.</li> <li>2 angles correct and correctly labelled.</li> <li>1 angle correct and correctly labelled.</li> <li>10 OR</li> <li>10 OR 1 for their diagram or no diagram, 360/240.</li> <li>Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.</li> <li>10. Total cost of carrots = £27.63 - 12.6 × 1.85 = (£1, 432 OR 432(p))</li> <li>a carrots cost per kg = 4.32/54 = (£0, 20, 20, 432(p))</li> <li>a B0 (p) OR (£) (0).8(0)</li> <li>Look for</li> <li>Spelling</li> <li>Clarity of text explanations</li> <li>The use of notation - watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>M0</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>M2</li> <li>M2</li> <li>M3</li> <li>M4</li> <li>M4</li> <li>M5</li> <li>M4</li> <li>M6</li> <li>M6</li> <li>M6</li> <li>M1</li> <li>M1</li> <li>M2</li> <li>M2</li> <li>M2</li> <li>M3</li> <li>M4</li> <li>M4</li></ul>	8. (c) 144 (minutes) OR 2 hours 24 minutes	B1	Accept 2:24 or 2.24
<ul> <li>5. Angles are 144°, 96°, 78° and 42°</li> <li>A B C D</li> <li>3 or 4 angles correct and correctly labelled.</li> <li>2 angles correct, labels not fully correct.</li> <li>2 angles correct abels not fully correct.</li> <li>1 angle correct abels not fully correct.</li> <li>2 angles correct abels not fully correct.</li> <li>1 angle correct abels not fully correct.</li> <li>2 angles correct abels not fully correct.</li> <li>1 angle correct abels not fully correct.</li> <li>2 angles correct abels not fully correct.</li> <li>3 correct labels not fully correct.</li> <li>3 correct labels not fully correct.</li> <li>3 correct labels not fully correct.</li> <li>4 angles correct abels not fully correct.</li> <li>5 Charity of text explanations</li> <li>5 The use of notation - watch for kg, '=', '£', 'p' being used appropria</li></ul>	8. (d) Correct line drawn to (118, 17:24)	B1	Allow $\pm \frac{1}{2}$ square, but line must stop at his point.
A B C D       D         3 or 4 angles correct and correctly labelled.       B4         3 or 4 angles correct, labels not fully correct.       B3         2 angles correct albeds not fully correct.       B3         1 angle correct ables not fully correct.       B2         1 angle correct ables not fully correct.       B3         1 angle correct ables not fully correct.       B2         1 correct labels (Words NOT the frequency OR angle).       3 correct labels (Words NOT the frequency OR angle).         0 CR       1 for their diagram or no diagram.       360/240.         1 (1 for their diagram or no diagram.       360/240.       B1         1 (1 for their diagram or no diagram.       360/240.       M1         1 (2 for this M1, A1.       A1       M1       A1 for 2 marks.         1 (2 for this M1, A1.       (1 is) 1½2 gets the M1.       M1         1 (2 for all correct percentages: 40, 26-7, 21-7, 1.7.       M1       (£)27.63 - (£)23.31         2 correct labels (WCC Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar and include units in therif final answer	9. Angles are 144°, 96°, 78° and 42°		
3 or 4 angles correct and correctly labelled.       B4       OR         3 or 4 angles correct, labels not fully correct.       B3         2 angles correct and correctly labelled.       B3         2 angles correct and correctly labelled.       B3         0 R       B1         If 0 OR 1 for their diagram or no diagram.       360/240.         Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.       M1         10. Total cost of carrots = £27.63 - 12.6 × 1.85       M1         = (£) 4.32 OR 432(p)       A1         Carrots cost per kg = 4.32/5.4       M1         = 80 (p) OR (£) (0) 8(0)       A1         Look for       Spelling         • The use of notation – watch for kg, '=', '£', 'p' being used appropriately.       QWC         QWC2: Candidates will be expected to       Present work clearly, with words explaining their processes or steps       QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation and grammar and include units in their final answer       QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation and grammar and include units in their final answer         0R       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include       QWC0 Evident weaknesses in organisation of material, and erors in use of mathematical form, spelling,			
ORORCorrect labels (Words NOT the frequency OR angle).3 or 4 angles correct, labels not fully correct.3 correct labels is enough.2 angles correct and correctly labelled.B3ORIf only B1 is scored for the diagram, and all the angles given correctly, then cancel the B1 and awardIn the third diagram or no diagram.360/240.Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.M1It only B1 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.It only B2 is scored for the diagram.It only B2 is scored for the diagram or not diagram.It only B2 is scored for the diagram or not diagram.It on	3 or 4 angles correct and correctly labelled.	B4	
3 or 4 angles correct, labels not fully correct. 2 angles correct and correctly labelled.       B3 B3 B3 B3 B3 B3 B3 B3 B3 B3 B3 B3 B3 B		OR	Correct labels (Words NOT the frequency OR angle).
2 angles correct and correctly labelled. 2 angles correct, labels not fully correct. 1 angle correct and correctly labelled.B3 B2 B1OR If 0 OR 1 for their diagram or no diagram, 360/240. Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.If only B1 is scored for the diagram, and all the angles given correctly, then cancel the B1 and award M1 M1. A1 for 2 marks. If B0 scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded. (1 is) 1½° gets the M1. OR SC1 for all correct percentages: 40, 26-7, 21-7, 11-710. Total cost of carrots = £27.63 - 12-6 × 1.85 = (£) 4.32 OR 432(p) Earrots cost per kg = 4.32/54 S = 60 (p) OR (£) (0)-8(0)M1 A1 E T. 'their 4.32', but not £27.63. Final answer must be in correct money formatLook for • Spelling • Clarity of text explanations • The use of notation - watch for kg, '=', '£', 'p' being used appropriately. ANDM1 • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answerM2 • Clarity of text explaning their processes or stepsQWC2: Candidates will be expected to • present work clearly, with words explaining their processes or stepsQWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation and grammar and includeQWC1: Candidates will be expected to • present work clearly, with words explaining their processes or stepsQWC2 Evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar and includeQWC1: Candidates will be expected to • present work clea	3 or 4 angles correct, labels not fully correct.	B3	3 correct labels is enough.
2 angles correct, labels not fully correct. 1 angle correct and correctly labelled.B2 B1OR If O OR 1 for their diagram or no diagram, 360/240. Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.If only B1 is scored for the diagram, and all the angles given correctly, then cancel the B1 and award M1, A1 for 2 marks. If B0 scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded. (1 is) 1½° gets the M1. OR SC1 for all correct percentages: 40, 26·7, 21·7, 11·710. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p) Carrots cost per kg = 4.32/5·4 = 80 (p) OR (£) (0)·8(0)M1 A1 A1 A110. Total cost of carrots cost per kg = 4.32/5·4 = 80 (p) OR (£) (0)·8(0)M1 A1 A1Clarity of text explanations • Dreuse of notation - watch for kg, '=', '£', 'p' being used appropriately.M1 QWC2: Candidates will be expected to • present work clearly, with words explaining their processes or stepsCWC1 QWC1 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, spelling, punctuation and grammar and include units in their final answerQWC1: Candidates will be expected to • present work clearly, with words explaining their processes or stepsQWC1 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, with few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answerQWC1: Candidates will be expected to • present work clearly, with words explaining their processes or stepsQWC1 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, with	2 angles correct and correctly labelled.	B3	
I angle correct and correctly labelled.B1OR If OOR 1 for their diagram or no diagram, 360/240. Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.B1IIII O OR 1 for their diagram or no diagram, 360/240. Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.M1IIII O Total cost of carrots = £27.63 - 12.6 × 1.85 = (£) 4.32 OR 432(p)M1IIII Crotal cost of carrots = £27.63 - 12.6 × 1.85 = (£) 4.32 OR 432(p)M1IIII Crotal cost of carrots = £27.63 - 12.6 × 1.85 = (£) 4.32 OR 432(p)M1IIII Crotal cost of carrots e stepsM1IIII Crotal cost of carrots e stepsQWCCIIII Crotal cost of carrots e stepsQWC2IIII Crotal cost of carrots e stepsQWC2IIIII Crotal cost of carrots e stepsQWC1IIIII Crotal cost of carrots e stepsIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	2 angles correct, labels not fully correct.	B2	
OR If 0 OR 1 for their diagram or no diagram, 360/240. Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.If only B1 is scored for the diagram, and all the angles given correctly, then cancel the B1 and award M1, A1 for 2 marks. If B0 scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded. (1 is) 1½° gets the M1. OR Sc1 for all correct percentages: 40, 26·7, 21·7, 11.710. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p) Carrots cost per kg = 4.32/54 = 80 (p) OR (£) (0)·8(0)M1 A1 F.T. 'their 4.32', but not £27.63. Final answer must be in correct money format10. Total cost of text explanations • The use of notation – watch for kg, '=', '£', 'p' being used appropriately. QWC2: Candidates will be expected to • present work clearly, with words explaining their processes or stepsM1 A1 F.T. 'their 4.32', but not £27.63. Final answer must be in correct money formatAND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answerQWC1 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, spelling, punctuation and grammar and include units in their final answerOR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and includeGROR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and includeGROR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and includeGROR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and includeGROR	1 angle correct and correctly labelled.	B1	
OR       in angles given correctly, then cancel the B1 and award angles given correctly, then cancel the B1 and award M1, A1 for 2 marks.         I do OR 1 for their diagram, or no diagram, 360/240.       M1         Look for the angles 144°, 96°, 78° and 42° calculated correctly for this M1, A1.       M1         A1       M1         M1       (1 is) 1½° gets the M1.         OR sc1 for all correct percentages: 40, 26·7, 21·7, 11·7         10. Total cost of carrots = £27.63 – 12·6 × 1.85       M1         = (£) 4.32 OR 432(p)       A1         Carrots cost per kg = 4.32/5·4       M1         = 80 (p) OR (£) (0)·8(0)       A1         Final answer must be in correct money format       Final answer must be in correct money format         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 and include units in their final answer         QWC1: Candidates will be expected to       QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, with few if any errors in spelling, pun			If only B1 is scored for the diagram, and all the
If OCK 1 for their diagram, or no diagram, 360/240.       MI         Look for the angles 144°, 96°, 78° and 42° calculated       If B0 scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.         (1)       Total cost of carrots = £27.63 – 12·6 × 1.85       MI         (1)       (1)       Total cost of carrots = £27.63 – 12·6 × 1.85       MI         (1)       (2)       (2)       (2)         (2)       (2)       (2)       (2)         (3)       (2)       (2)       (2)         (4)       (2)       (2)       (2)         (5)       (4)       (2)       (2)         (4)       (4)       (2)       (2)         (5)       (4)       (4)       (4)         (5)       (4)       (4)       (4)         (5)       (4)       (4)       (4)         (6)       (5)       (4)       (4)         (7)       (5)       (4)       (5)         (8)       (7)       (7)       (7)         (9)       (1)       (1)       (1)         (1)       (2)       (2)       (2)         (1)       (1)       (1)       (1)         (2)       (2) <td></td> <td>241</td> <td>angles given correctly, then cancel the B1 and award</td>		241	angles given correctly, then cancel the B1 and award
<ul> <li>Look for</li> <li>In the scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded.</li> <li>(1 is) 1½° gets the M1.</li> <li>(1 is) 14% gets the M1.</li> <li>(2 is) 14% gets the M1.</li> <li>(3 is) 14% gets the M1.</li> <li>(4 is) 14% gets the M1.</li> <li>(5 is) 14% gets the M1</li></ul>	$\frac{\text{If } 0 \text{ OR I for their diagram or no diagram, } 360/240.$	MI	M1, A1 for 2 marks.
<ul> <li>All and the helicol of see if the wirf and the AT can be awarded.</li> <li>(1 is) 11/2° gets the M1. OR SCI for all correct percentages: 40, 26·7, 21·7, 11·7</li> <li>10. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p) Carrots cost per kg = 4.32/5·4 = 80 (p) OR (£) (0)·8(0)</li> <li>Look for</li> <li>Spelling</li> <li>Clarity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>Mate few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	Look for the angles 144 <sup>-</sup> , 96 <sup>-</sup> , 78 <sup>-</sup> and 42 <sup>-</sup> calculated	A 1	If BU scored for the diagram, check the angles and the method to see if the M1 and the A1 can be
<ul> <li>In the section of the secti</li></ul>	confectly for this M1, A1.	AI	awarded
10. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p)       M1 A1         10. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p)       M1 A1         10. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p)       M1 A1         10. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p)       M1 A1         11. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p)       M1 A1         11. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p)       M1 A1         11. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p)       M1 A1         11. Total cost of carrots = £27.63 - 12·6 × 1.85 = (£) 4.32 OR 432(p)       M1 A1         12. Cost for all correct percentages: 40, 26·7, 21·7, 11·7       M1         13. Total cost of carrots = £27.63 - 12·6 × 1.85       M1         14. Cost of carrots = £27.63       Final answer must be in correct money format         QWC2       Presents relevant material in a coherent and logical manner, using acceptable mathematical form, spelling, punctuation and grammar and include units in their final answer       QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation and grammar and include         AND       • make few if any mistakes in mathematical form, spelling, punctuation and grammar.       OR         QWC1: Candidates will be expected to       • present work clearly, with words explaining their processes or steps </td <td></td> <td></td> <td>(1  is) 1<sup>1</sup>/<sub>2</sub> ° gets the M1.</td>			(1  is) 1 <sup>1</sup> / <sub>2</sub> ° gets the M1.
11.710. Total cost of carrots = £27.63 - 12.6 × 1.85 = (£) 4.32 OR 432(p)11.711.			OR SC1 for all correct percentages: 40, 26.7, 21.7,
<ul> <li>10. Total cost of carrots = £27.63 - 12.6 × 1.85 = (£) 4.32 OR 432(p)</li> <li>Carrots cost per kg = 4.32/5.4 = 80 (p) OR (£) (0) ·8(0)</li> <li>Look for</li> <li>Clarity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>M1</li> <li>A1</li> <li>F.T. 'their 4.32', but not £27.63.</li> <li>Final answer must be in correct money format</li> <li>QWC2 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar.</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>			11.7
<ul> <li>= (£) 4.32 OR 432(p)</li> <li>Carrots cost per kg = 4.32/5-4</li> <li>= 80 (p) OR (£) (0) ·8(0)</li> <li>Look for</li> <li>Clarity of text explanations</li> <li>Clarity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	10. Total cost of carrots = $\pounds 27.63 - 12.6 \times 1.85$	M1	$(\pounds)27.63 - (\pounds)23.31$
<ul> <li>Carrots cost per kg = 4.32/5·4 = 80 (p) OR (£) (0)·8(0)</li> <li>Look for</li> <li>Spelling</li> <li>Clarity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	= (£) 4.32 OR 432(p)	A1	
<ul> <li>= 80 (p) OR (£) (0) ·8(0)</li> <li>Look for</li> <li>Spelling</li> <li>Clarity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	Carrots cost per kg = $4.32/5.4$	M1	
<ul> <li>Look for</li> <li>Spelling</li> <li>Clarity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, and errors in use of mathematical form,</li> </ul>	$= 80 \text{ (p) OR } (\text{\pounds}) (0) \cdot 8(0)$	A1	F.T. 'their 4.32', but not £27.63.
<ul> <li>Spelling</li> <li>Clarity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	Look for	OWC	Final answer must be in correct money format
<ul> <li>Clarity of text explanations</li> <li>The use of notation – watch for kg, '=', '£', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	• Spelling	Qwc	OWC2 Presents relevant material in a scherent and
<ul> <li>The use of notation – watch for kg, '=', 't', 'p' being used appropriately.</li> <li>QWC2: Candidates will be expected to <ul> <li>present work clearly, with words explaining their processes or steps</li> </ul> </li> <li>AND <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to <ul> <li>present work clearly, with words explaining their processes or steps</li> </ul> </li> <li>QWC1: Candidates will be expected to <ul> <li>present work clearly, with words explaining their processes or steps</li> </ul> </li> <li>OR <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul> </li> </ul></li></ul>	• Clarity of text explanations	2	logical manner, using accentable mathematical form
<ul> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>AND <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> </ul> </li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul> </li> </ul>	• The use of notation – watch for kg, = , t, p		and with few if any errors in spelling punctuation
<ul> <li>Present work clearly, with words explaining their processes or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	OWC2: Candidates will be expected to		and grammar.
<ul> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	• present work clearly with words explaining their		
<ul> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to         <ul> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul> </li> <li>Mathematical form, spelling, punctuation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.</li> <li>OR</li> <li>OR</li> <li>Make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	processes or steps		QWC1 Presents relevant material in a coherent and
<ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to         <ul> <li>present work clearly, with words explaining their processes or steps</li> <li>Make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul> </li> </ul>	AND		logical manner but with some errors in use of
<ul> <li>spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to <ul> <li>present work clearly, with words explaining their processes or steps</li> </ul> </li> <li>OR <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul> </li> <li>grammar. OR <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul> </li> </ul>	• make few if any mistakes in mathematical form.		mathematical form, spelling, punctuation or
<ul> <li>units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>OR</li> <li>OR</li> <li>QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation and grammar and include</li> </ul>	spelling, punctuation and grammar and include		grammar.
<ul> <li>QWC1: Candidates will be expected to         <ul> <li>present work clearly, with words explaining their processes or steps</li> </ul> </li> <li>OR         <ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>Evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar and include</li> </ul> </li> </ul>	units in their final answer		UK Evident weekneede in anomination (for the 11 t
<ul> <li>present work clearly, with words explaining their processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>GR make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> </ul>	QWC1: Candidates will be expected to		Evident weaknesses in organisation of material but using acceptable methomatical form, with faw if are
<ul> <li>processes or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include</li> <li>QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation and grammar and include</li> </ul>	• present work clearly, with words explaining their		errors in spelling punctuation and grammar
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• make tew if any mistakes in mathematical form, spelling, punctuation and grammar and include			OWC0 Evident weaknesses in organisation of
spenning, punctuation and grammar and include	• make tew if any mistakes in mathematical form,		material, and errors in use of mathematical form,
units in their final answer spenning, punctuation and grammar.	units in their final answer		spelling, punctuation and grammar.

JUNE 2012 UNIT 3 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME
11.(a) All points correctly plotted	B2	Ignore any attempt to draw a line of best fit. B1 for 3, 4 or 5 points correctly plotted, not joined. B1 if all points plotted correctly but joined.
(b)(i) Method of finding the mean for thumb or foot, sum of 6 appropriate measurements and intention to divide their sum by 6	M1	(354/6 or 162/6)
Thumb 59 (mm) Foot 27 (cm)	A1	Does not need to be expressed as coordinates Sight of thumb 59 (mm) or foot 27 (cm) implies M1 Statement that the line passes through mean without any attempt at calculation is M0, A0
<ul> <li>(ii) <u>Appropriate</u> straight line of best fit through Thumb 59 (mm), Foot 27 (cm), with some values above and some values below the line on each side of the mean point</li> </ul>	B2	Need to check passes through (59, 27) even if not calculated. Accept line of best fit that passes through (40,10) FT from (i) for B2 if reasonable; however if their means produce an unreasonable line but it is drawn through the point then award B1 only. B1 straight line through the mean point but not a reasonable line of best fit B1 reasonable straight line of best fit but not through the mean point
(c) Positive	B1	
11.(d) Explanation, e.g. "otherwise points would be squashed", "no small values", "efficient use of the graph paper", "a clearer display", 'no one had thumb and feet measurements below those shown", " it would be a waste of graph paper", "too big a gap between zero and the data range"	E1	Do not accept "no zig-zag (to show a missing part of the axes)", or "can't have zero length thumb or foot", "can't have zero length of thumb or foot", without further explanation Do not accept if only referring to the point (0,0)
12. (a) $12.6 \times 3.2$ 40(cm <sup>2</sup> ) or 40.3(cm <sup>2</sup> ) or 40.32(cm <sup>2</sup> )	M1 A1	Accept an unsupported correct answer
13. Strategy: length + width = 10 OR $2 \times \text{length} + \text{width} = 17$ OR length = $17 - 10$	S1	Strategy for finding the dimensions of a rectangle
Length = 7cm Width = 3 cm Area = $4 \times 7 \times 3$ = $84$ cm <sup>2</sup>	B1 B1 M1 A1 U1	F.T. 'their 7' and 'their 3'

JUNE 2012	Manka	FINAL MARK SCHEME
UNIT 3 (Calculator allowed) Foundation Tier	Marks	Comments
14. Understanding that 11 itre = $10 \times 100$ ml or 11 itre = 1000 ml	B1	May be seen or implied
Hint of pink: 800ml white, 200ml red	B1	Or sight of 8:2, or sight of 4/5 white with 1/5 red, or white and red quantities in the correct ratio seen but NOT 4 (100ml),1 (100ml)
Hint of purple: 4000ml white, 600ml blue, 400ml red	B1	Or sight of 40:6:4, or sight of 20/25 white with, 3/25 blue and 2/25 red or equivalent, or white, blue and red quantities in the correct ratio seen but NOT 20(100ml), 3(100ml), 2(100ml)
Method of costing, e.g. costing correctly expressed for hint of pink or hint of purple, or equivalent or 1 correct product in the sum of 3, or 2 correct products in the sum of 5 combined calculations shown below.	M1	(Maybe <sup>1</sup> / <sub>2</sub> these values, then doubled) N.B. The cost of hint of pink or hint of purple may be found within a combined calculation, this gets M1 (Hint of pink (£)12.3(0), hint of purple (£)61.2(0))
$48 \times 1.2(0) + 6 \times 1.3(0) + 6 \times 1.35$ (need 1 correct product in a sum of 3, using all correct paint prices) OR $8 \times 1.2(0) + 2 \times 1.35$ $+ 40 \times 1.2(0) + 6 \times 1.3(0) + 4 \times 1.35$ (need 2 correct products in a sum of 5, using all correct paint prices)		(Note: sight of, for example (£)12.30, triggers: B1 (1000ml = 1 litre), B1 Hint of pink ratio, and M1 for stage correct towards an overall calculation)
48×1.2(0) + 6×1.3(0) + 6×1.35, OR 8×1.2(0) + 2×1.35 + 40×1.2(0) + 6×1.3(0) + 4×1.35	A1	(57.6(0) + 7.8(0) + 8.1(0)) (9.6(0) + 2.7(0) + 48 + 7.8(0) + 5.4(0))
(£)73.5(0)	A1	САО
		SC1 for £36.75, with possible first B1 for unit conversion if seen
		Treat working with hint of blue with one of the other shades of paint as MR-1 then FT for all <u>marks</u> (Cost of 11itre of hint of blue is £12.11, so 51itres is £60.55)

### UNIT 3 (HIGHER TIER)

JUNE 2012 UNIT 3 Higher		FINAL MARK SCHEME
1.(a) $12.6 \times 3.2$ 40(cm <sup>2</sup> ) or 40.3(cm <sup>2</sup> ) or 40.32(cm <sup>2</sup> )	M1 A1	Accept an unsupported correct answer
1.(b) Sight of 360(°) 360 ÷ 22.5 = 16 (sides)	B1 M1 A1	Award all marks for an unsupported answer of 16
		Interior angle methods:
		M1 Use of 157.5 as an interior angle with, For example $157.5 = 180(n - 2)/n$ A1 $157.5n = 180n - 360$ or $n = 360/22.5$ A1 16 (sides)
		M1 Attempt use a trial & improvement, with 2 appropriate trials using, for example: (Number of triangles × 180) /(number of triangles +2) A2 16 (sides) or A1 for two correct trials, one leading to $\geq$ 157.5(°) and one leading to $\leq$ 157.5(°)
2.(a) All points correctly plotted and not joined	B2	Ignore any attempt to draw a straight line of best fit. B1 for 3, 4 or 5 points correctly plotted, not joined. B1 if all points plotted correctly but joined.
(b)(i) Method of finding the mean for thumb or foot, sum of 6 appropriate measurements and intention to divide their sum by 6	M1	(354/6 or 162/6)
(Thumb) 59 (mm) (Foot) 27 (cm)	A1	Does not need to be expressed as coordinates Sight of thumb 59 (mm) or foot 27 (cm) implies M1 Statement that the line passes through mean without any attempt at calculation is M0, A0
(ii) <u>Appropriate</u> straight line of best fit through Thumb 59 (mm), Foot 27 (cm), with some values above and some values below the line on each side of the mean point	B2	Need to check passes through (59, 27) even if not calculated. Accept line of best fit that passes through (40,10) FT from (i) for B2 if reasonable; however if their means produce an unreasonable line but it is drawn through the mean point then award B1 only. B1 straight line through the mean point but not a reasonable line of best fit B1 reasonable straight line of best fit but not through the mean point
(c) Positive	B1	the mean point
2.(d) Explanation, e.g. "otherwise points would be squashed", "no small values", "efficient use of the graph paper", "a clearer display", 'no one had thumb and feet measurements below those shown", " it would be a waste of graph paper", "too big a gap between zero and the data range"	E1	Do not accept "no zig-zag (to show a missing part of the axes)", "can't have zero length of thumb or foot", without further explanation Do not accept if only referring to the point (0,0)
3.(a) A line from (0,0) to (1 30 pm, 60) Horizontal line joining the first line, for period 30 minutes From end of horizontal line to (5 p.m., 120)	B1 B1 B1	Points need to be joined, not necessarily a straight line FT from their first line FT from the end of their second line. Points need to be joined, not necessarily a straight line
(b) 120 / 5 24 (mph)	M1 A1	Only FT their travel graph provided at least B1 in (a) Accept 120/4.5 leading to an answer of 26.6(6) or 26.7 or 27 (mph) <i>SC1 for an answer of 27.9(0) from a calculation</i> 120/4.3

JUNE 2012		FINAL MARK SCHEME
UNIT 3 Higher		Comments
4(a) 15x(x - 3)	B2	B1 for $15x(x \dots)$ or $15x(\dots - 3)$ or correct partial factorisation
4(b) $2/3 x + 1/3 x = 10 - 6$ OR $2x + 3 \times 6 = 3 \times 10 - x$	B1	FT until 2 <sup>nd</sup> error
x = 4	B1	Do not accept $12/3$ as a final answer. Final answers
		must be simplified if possible
		2x+6 = 10 - 1x is 2 errors, hence B0, B0
4(c) -64	B1	CAO
4(d) E.g. (2×9 7)/50	M1	Substitution with at least two steps of calculation
		'—7' written as '+7' is one step of calculation
25/50	A1	
0.5	Al	Decimal answer required. FT provided M1 awarded
		If no marks: SCI for answers 0.22, 0.38 or 18.14
5 Lines or unambiguous set of points parallel to all sides of	BJ	Jollowing evidence of substitution
the box radius width from the box	D2	B1 for one set of points or lines parallel to the box
		radius width from the box
Intention of all lines in the correct position that <b>stop</b> and	B1	If sets of points are shown there needs to be sufficient
intention to meet at right angles at all four corners of the		evidence to show the intention of parallel lines and the
box		4 right angles
		A set of points implies at least 3 points, which may
		include the one given in the question
		Ignore extra additional arcs or lines used to develop a
		metnoa
		Ignore any regions shaded
6. One correct evaluation,	B1	$x x^3 - x - 5$
$1 \le x \le 2$		1 -5
		1.1 -4.769
2 correct evaluations,	B1	1.2 -4.472
$1.85 \le x \le 2$ , one either side of 0		1.3 -4.103
2 compations	M1	1.4 -3.000 1.5 3.125
2 correct evaluations, 1.85 < r < 1.95, one either side of 0.	1011	1.5 - 5.125 1.6 -2 504
OR correct evaluation of 1.95 if previous B1 awarded		1.7 -1.787
on contest evaluation of 1.95 in previous by awarded		1.8 -0.968
1.9	A1	1.85 -0.518375
<i>No calculations shown: accept "too high", "&gt;", etc.</i>		1.9 -0.041
		1.91 0.057871
		1.92 0.157888
		1.93 0.259057
		1.94 U.301384 1 05 0 //6/075
		2 1

JUNE 2012		FINAL MARK SCHEME
UNIT 3 Higher	D1	Comments
/. Understanding that $11$ tre = $10 \times 100$ ml or $11$ tre = $1000$ ml	BI	May be seen or implied
Hint of pink: 800ml white, 200ml red	B1	Or sight of 8:2, or sight of 4/5 white with 1/5 red, or white and red quantities in the correct ratio seen but NOT 4 (100ml),1 (100ml)
Hint of purple: 4000ml white, 600ml blue, 400ml red	B1	Or sight of 40:6:4, or sight of 20/25 white with, 3/25 blue and 2/25 red or equivalent, or white, blue and red quantities in the correct ratio seen but NOT 20(100ml), 3(100ml), 2(100ml)
Method of costing, e.g. costing correctly expressed for hint of pink or hint of purple, or equivalent or 1 correct product in the sum of 3, or 2 correct products in the sum of 5 combined calculations shown below.	M1	(Maybe ½ these values, then doubled) N.B. The cost of hint of pink or hint of purple may be found within a combined calculation, this gets M1 (Hint of pink (£)12.3(0), hint of purple (£)61.2(0))
$48 \times 1.2(0) + 6 \times 1.3(0) + 6 \times 1.35$ (need 1 correct product in a sum of 3, using all correct paint prices) OR $8 \times 1.2(0) + 2 \times 1.35$ $+ 40 \times 1.2(0) + 6 \times 1.3(0) + 4 \times 1.35$ (need 2 correct products in a sum of 5, using all correct paint prices)		(Note: sight of, for example $(\pounds)12.30$ , triggers: B1 (1000ml = 1 litre), B1 Hint of pink ratio, and M1 for stage correct towards an overall calculation)
48×1.2(0) + 6×1.3(0) + 6×1.35, OR 8×1.2(0) + 2×1.35 + 40×1.2(0) + 6×1.3(0) + 4×1.35	A1	(57.6(0) + 7.8(0) + 8.1(0)) (9.6(0) + 2.7(0) + 48 + 7.8(0) + 5.4(0))
$(\pounds)73.5(0)$	A1	CAO
QWC2 requires process steps for both colours linked with appropriate text and correct use of units, with the £ symbol given inthe final answer. If the candidate has not engaged with the complexity of the question, then maximum QWC1 if process steps for both colours is linked with appropriate text, units are generally used and £ symbol given in the final answer	Q	SC1 for £36.75, with possible first B1 for unit conversion if seen Treat working with hint of blue with one of the other shades of paint as MR-1 then FT for all marks (Cost of 1litre of hint of blue is £12.11, so 5litres is £60.55)
Must be relevant work for the problem otherwise OWCO	C	200.55)
Look for • relevance • spelling • clarity of text explanations, • the use of notation (watch for the units and '0'	2	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.
for unit pence when using £)		logical manner but with some errors in use of
<ul> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining process or steps</li> </ul>		OR Evident weaknesses in organisation of material but using acceptable mathematical form, with few if any
<ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar in their final</li> </ul>		errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material,
answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps		and errors in use of mathematical form, spelling, punctuation and grammar.
<ul> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar in their final answer</li> </ul>		
8.(a) Median 20 Interquartile range: (24 to 24.5) – (15.5 to 16) Answers in the range 8 to 9 inclusive	B1 M1 A1	Intention to subtract must be clear Must FT from their calculation if shown
		Treat working with The Leopards as MR-1 only if consistent for median and inter-quartile range Leopards: Median 16 to 16.5 IQR (22 to 22.5) - 10.5 = 11.5 to 12

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8.(b) Valid reason e.g., 'median is higher', 'median is slower than The Leopards', 'greater number of players took longer to finish', 'most of the data times for The Tigers is behind The Leopards'	M1	Selecting The Leopards is M0, A0
The Tigers	A1	Must be with a valid reason N.B. remember slower times are to the right of the
8 (c) Mid points 5 15 25 35	B1	alagram
$5 \times 2 + 15 \times 30 + 25 \times 45 + 35 \times 3$	M1	FT for their mid points from within group (including bounds)
$\sum fx / 80 \ (= \ 1690 / 80) \\ 21(.125)$	m1 A1	FT their $\sum fx / 80$ Accept 21.13
9. $4(8x-5) + 3(4x+5) = 149$	M2	For correctly clearing all 3 fractions, OR M1 for clearing 2 fractions
44x - 5 = 149	A1	FT from M1 (for all further marks), for their equation, for correct expansion of bracket(s) and collection of like terms on LHS
x = 154/44 (=3.5)	A1	Ignore incorrect cancelling
10. Strategy, using Pythagoras' Theorem then trigonometry $8.2^2 = 6.3^2 + AC^2$ $AC = \sqrt{(8.2^2 - 6.3^2)} (=\sqrt{27.55})$ AC = 5.248 Tan D = AC / 10.6 Answers in the range 26.1(°) to 26.35(°)	S1 M1 A1 M1 A1	Needs to involve working towards use of triangle ADC FT candidates AC Allow rounded or truncated answers in working throughout, but the final answer must be in the given range to award the final A1 Alternative: S1 Complete strategy M1 method for both of the first 2 stages A1 for first stage answer A1 for second stage answer M1 method for the third stage A1 Answers in the range 26.1(°) to 26.35(°) For example: S1 Strategy, using trigonometry – cos ratio, cosine rule and sine rule M1 cosB = 6.3/8.2 AND $AD^2 = 8.2^2 + 16.9^2 - 2 \times 8.2 \times 16.9 \times cosB$ A1 Angle B = 39.799 rounded or truncated A1 AD = 11.828 rounded or truncated M1 sinD/8.2 = sinB/11.8 FT candidates angle B A1 Answers in the range 26.1(°) to 26.35(°)
11.(a) Volume = $4/3 \times \Pi \times 8^3$ Answers in the range 2143 to 2146 (cm <sup>3</sup> ) inclusive	M1 A1	

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11.(b) Strategy, attempt to form an equation using the	S1	Not for an expression
product of at least 3 of the given: $\frac{1}{3}$ , 24, x, $(3x + 1)$ ,		
and showing '=192'		
$1/3(3x+1) \times x \times 24 \ (= 192)$	M1	Correct expression or equation
$24x^2 + 8x - 192 = 0 \qquad \text{or} \qquad 3x^2 + x - 24 = 0$	A1	Collecting terms and equate to zero
$(3x \dots 8)(x \dots 3) (= 0)$	M1	FT their quadratic equivalent difficulty
x = 8/3 (and x=-3)	A1	FT for correct solution of their quadratic
Dimension of the base 8/3 (cm) and 9 (cm)	B1	FT only if there is a need to discard one negative
		answer and provided previous M1 awarded
		For formula method, last 3 marks:
		Correct substitution in formula with correct evaluation
		of $b^2$ -4ac M1, then possible A1 & B1 as main method
		For a trial & improvement method
		SI As main method
		M1 Implied as main method
		A1 Implied as main method, but may be trials towards
		192
		M1 Two correct trials, one either side of 192, or
		including 192
		A1 8/3 (cm) or 2.6666(cm) (Accept 2.67, do not
		accept 2.6, 2.7 or 3)
		B1 Dimension of the base $8/3$ (cm) and 9 (cm) (only
		FT provided previous M1 awarded)
		Watch for correct answers from incorrect methods, do
		not automatically awara 6 marks for signt of correct
	M1	answers
12. $2 \times (125/360) \times 11 \times 3.6$ = 7.85(208 am) or 7.0 (cm)		
- 7.85(598 cm) of 7.9 (cm)	AI	
13 (a) Method of finding an area	M1	
2 correct areas AND intention to add all areas	M1	$\Delta reas are 30+70+80+20$
	A1	CAO
200	711	cho
13.(b)		Must be from 200, not FT
Identifying the 100, 100 split	M1	May be indicated on the histogram.
ine ine ine i e i e i e i e e e e e e e		Accept sight of $200-2 = 100$
40 (seconds)	A1	CAO. Check (a), if working is shown it must be from
		the 100, 100 split, not a 10, 10 split.
		Unsupported 40, is M1, A1
14. F = $k/d^2$ or F $\propto 1/d^2$	M1	
$8 = k/5^2$	M1	FT only non linear
$k = 200$ or $F = 200/d^2$	A1	-
$12.5 = k/d^2$	M1	FT their k, and their non linear if possible
$d^2 = 16$	A1	
d = 4 mm	A1	CAO with unit mm
15. Finding y=8 when x=1 and y=5 when x=2	B1	
Split into 3 areas and attempt to sum,	M1	FT their values for y at x=0, 1, 2 & 3. Must be clearly
or 1 slip in stating <b>OR</b> substitution into trapezium rule		working with area, may be incorrect formula for
		trapezium (8.5+6.5+2.5)
Correct substitution into trapezium rule	M1	Or equivalent. FT their values for y at $x=1\&2$ , OR 2
		areas correct in sum of 3
17.5	A1	CAO
	1	

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UNIT 3 Higher		Comments
16. Strategy: use of similar triangles with sine rule or	S1	
parallel lines with sine rule		
Use of scale factor 1.5 or 2/3 as appropriate, or angles in	M1	
ABC correctly as (60,) 80 and 40		
DE/sin 60 = 9/sin 40 or $AB/sin 60 = 6/sin 40$	M1	
$DE = 9 \times \sin 60/\sin 40$ or $AB = 6 \times \sin 60/\sin 40$	m1	(DE = 12(.126  cm))
AB = 8(.084  cm)  or  8.1(cm)	A1	CAO
		Alternative:
		S1 Strategy: sine rule, similar triangles and cosine rule
		OR parallel lines, sine rule and cosine rule
		M1 $CD/sin80 = 9/sin40$ or $CD = sin80 \times 9/sin40$
		$OR  AC/sin80 = 6/sin40  or AC = sin80 \times 6/sin40$
		M1 $AC = \frac{2}{3}CD$ or $AC = 9.19$ (CD=13.79)
		$m1  AB^2 = 6^2 + AC^2 - 2 \times 6 \times AC \times cos60$
		(FT their AC but not their CD used)
		Al $AB = 8(.084cm)$ or $8.1(cm)$ CAO
		Unsupported 8(cm) gets no marks

GCSE Mathematics Unitised MS - Summer 2012



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