WJEC
CBAC

GCSE MARKING SCHEME

MATHEMATICS - UNITISED

JANUARY 2012

INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 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

UNIT 1 Foundation Tier	✓	Mark	Comments
1. (a) (£76.99) (£)31.75 (£)36(.00) (Total) (£)144.74 (b) 14 (points)		 B1 B1 B1 B1	 Accept 3175p. Accept 3600p F.T. their amounts. F.T. their total bill.
2(a) $35^{(\circ)}$ 2(b) Sight of 8·3(cm) 8·3 × 20 = 166m		B1 B1 M1 A1	Allow ± 2°. Allow ±2mm. F.T. their '8·3'. For stated intent to multiply a length by 20. Must show correct units. Unsupported answer in the region 162 to 170 implies B1, M1. Also A1 if units given.
2(c) **Use overlay.** A line from end of path B to mid point of path AC.		 B1	Allow ±2mm for mid point. **Use overlay.** Do not penalise poorly drawn lines.
3. (70 to 89) (90 to 109) **110 to 129** (130 to 149) Using a tally convention. (4) 9 7 2		B1 B1 B2	Accept any unambiguous indication e.g. 110 – 129. Need not be accurate. Must show a total of at least 13 additional tallies. B2 for all three correct. B1 for 1 or 2 correct.
4(a) (i) Jan(uary).		B1	
4(a) (ii) May.		B1	
4(b) (Hire Cost =) 50 × 5 + 85 = 335 ISW		M1 A1	For correct substitution BUT M0 if e.g. 50×90 used or implied.
4(c) Correct strategy (£)30		M1 A1	E.g. Using '10 × 6TND' or '6 × 10TND' etc.

UNIT 1 Foundation Tier	✓	Mark	Comments
5. (Perimeter or fence =) 20(m) (Cost of fence =) (£)140 (Area or concrete =) 6 × 4 = 24(m^2) (Cost of concrete =) (£)216 (Total cost =) (£)356 Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', '£', m and m^2 being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	B1 B1 M1 A1 A1 B1 QWC 2	F.T. 7 × their 'perimeter'. F.T. 9 × their 'area'. F.T their stated costs for the fence and the concrete. QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident 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.
6.(a) (i) A correct equation formed. (ii) A correct equation formed. (iii) A correct equation formed.		 B1 B1 B1	Must use given numbers once only in each case.
6(b) – ÷		B1	
7(a) (i) 'More girls than boys' or equivalent.		B1	Accept 'Twice as many girls as boys'. Do not accept 'more females passed'.
7(a) (ii) 25(%)		B1	¼ is B0.
7(b) Indication that the range of the marks in History is 6 and in Geography is 9		B2	Allow 'range in Geography is greater' or equivalent. B1 for ranges of 6 and 9 only, with no indication of which is which. OR B1 for 'History 2 to 8 and Geography 1 to 10' OR B1 for one correct range clearly attributed.
7(c) It might appear that the % increase is much greater for one period than the other because of the different scale used.		B2	B1 for comment on misleading visual appearance. B1 for comment on different scale used. Credit similar statements once only. *(Mark comments wherever they appear. Ignore other irrelevant comments.)*
8. 0·15 × (£)1240 + 36 × (£)42 = (£)186 (+) (£)1512 = (£)1698 ISW	✓ ✓ ✓ ✓	M1 B1 B1 A1	For complete method. For sight of 186 or implied in further calculation. For sight of 1512 or implied in further calculation. F.T. addition of their amounts. Correct answer gains all 4 marks.

UNIT 1 Foundation Tier	✓	Mark	Comments
9. 91.36 – (total cost of three other items) = (£)84.54 or 8454p (Diesel bought =) (£)84.54 ÷ 1.409 = 60(litres) ISW	✓ ✓ ✓ ✓	M1 A1 M1 A1	M1 for attempt so do not penalise incorrect total cost OR use of 48 instead of 0·48. C.A.O. F.T. 'their £84.54' (this may be £91.36) Accept answers from a F.T. being rounded or truncated . SC1 for attempting to divide by 140·9. M1A0 for dividing by 1·41 or 1·4(0). M0A0 for dividing by 1·49
10. Repeated attempt to find 1/3 <u>and subtract</u> or 2/3 of two different amounts. (End of 2nd year) 150(kg) (End of 3rd year) 100(kg)		M1 B1 A1	M1 awarded for intent. Penalise use of decimal approximations to 1/3 or 2/3 once only. Penalise extra work –1*(unsupported 66.6.. implies this).*
11(a) Q1. A statement regarding e.g. 'not relevant', 'confidentiality', 'too personal' Q2. 'times not exclusive' 'over what period of time?'		 B1 B1	*Only mark answer given in relevant answer space* *Ignore other statements if B1 awarded.* For any equivalent statement. For any **one** of these, or equivalent statement.
11(b) A criticism regarding location or time.		B1	
12. 55 × 1·6 or equivalent. = 88 (km.p.h.) 8 (km.p.h.) (above)		M1 A1 A1	*Alternate method.* 80 × 0·625 M1 = 50(m.p.h.) A1 F.T. 'their 88'. 5(m.p.h.)(above) A1 ('*above' not required, but 'under' is A0.)* *An unsupported final answer requires units.* *Unsupported 5(m.p.h.) <u>under</u> is M0A0A0*
13. **Use overlay** Position of ship 065° from Sunderland. Position of ship 6cm from Sunderland. Correct three-figure bearing given		 B1 B1 B1	 Allow ± 2°. Allow ± 2mm. (*Ship must be at sea for this B1)* F.T. their ship's position. Allow ± 2°. **Use tools.**
14. Use of Volume = $\pi \times 12^2 \times$ height. Height = Volume / $\pi \times 12^2$ (Height of water =) 19·88 to 19·91 inclusive. 20(cm)	✓ ✓ ✓ ✓	M1 m1 A1 A1	Allow 900, 90 or 9 as intent to use volume. C.A.O. F.T. 'their height' if of equivalent difficulty and gives an answer that is > 0.
15. 4000 <u>120</u> 4120 <u>123.6(0)</u> 4243.6(0) <u>127.30(8)</u> 4370.90(8) (£) 4370.91 ISW		B1 M1 A1 A1	For the evaluation of a correct 3% OR Sight of 1·03 (360 and 4360 imply use of 3× 120 and gain B1) For attempting to find 3 different 3%. OR $4000 \times 1{\cdot}03^3$. F.T. one error if of equivalent difficulty. Treat 2 years as a misread.

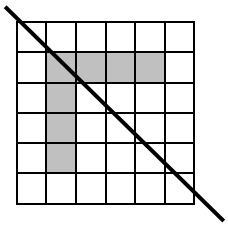
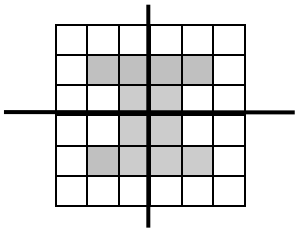
Unit 1 – Higher Tier

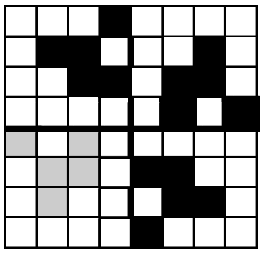
UNIT 1 Higher Tier	✓	Mark	Comments
1. Repeated attempt to find 1/3 and subtract ,or 2/3 of two different amounts. OR Repeated attempt to find 20% and subtract , or 80% of two different amounts. (Tree A =) 100(kg) (Tree B =) 128(kg) Tree B by 28(kg)		 M1 A1 A1 A1	*Treat going on for an extra year as a misread.* *Treat consistent increase as a misread.* M1 awarded for intent. C.A.O. C.A.O. F.T. their amounts. SC1 for Tree B by 45(kg) [(200–40–40) –(225–75–75)]
2(a) (i) Intent to multiply values by frequencies and add up $(0 \times 11 + 1 \times 25 + 2 \times 4 + 3 \times 2 + 30 \times 2)$ their $\sum fx \div 44$ $= 2{\cdot}25$		M1 m1 A1	 CAO (but ignore if 2·25 seen and then rounded to 2)
2(a) (ii) Some indication that this is not typical for the majority of the workforce.		B1	E.g. 'Most are absent fewer than 2 days', '30 days skew things'.
2(b) Some reference to most being in the first group or that most of the group intervals would be empty. OR Some reference to loss of raw data or that the answer will be an estimate		B1	Do not accept that '4 is not a factor of 30' for a B1.
3. **Use overlay** Position of ship 065° from Sunderland. Position of ship 6cm from Sunderland. Correct three-figure bearing given		 B1 B1 B1	 Allow ± 2°. Allow ± 2mm. (*Ship must be at sea for this B1)* F.T. their ship's position. Allow ± 2°. **Use tools.**
4. $55 \times 1{\cdot}6$ or equivalent. = 88 (km.p.h.) 8 (km.p.h.) (above)		M1 A1 A1	*Alternate method.* $80 \times 0{\cdot}625$ M1 = 50(m.p.h.) A1 F.T. 'their 88'. 5(m.p.h.)(above) A1 (*'above' not required, but 'under' is A0.)* *An unsupported final answer requires units.* *Unsupported 5(m.p.h.) under is M0A0A0*
5(a) (i) 5(%)		B1	
5(a) (ii) No because the graph show (%) growth not actual numbers.		B1	Accept equivalent valid statements.
5(b) E.g. 'No scale (so might not be 'huge'). 'Only two plots (so might not be 'steady'). 'Not clear how 'burglaries' are defined'.		B2	B1 for each valid reason. Credit similar reasons once only.
6 Sight of 8 hours difference in time. Sight of take off time as 18:10 (London) Correct addition of 11hrs 20 min. (Time in Los Angeles) 21:30 Tuesday		B1 B1 B1 B1	 May be given as 10:10 (Los Angeles) F.T. their 'initial' time. (Accept e.g. 05:30 but not 29:30) Must give both time and day. *These marks may be implied in their answer(s).* *E.g. (2h30min + 11h20min) '+' 07:40 =) 21:30 gains B3. 'Tuesday 21:30' on its own gains B4*

UNIT 1 Higher Tier	✓	Mark	Comments
7. (Taxable Income =) (£)44,850	✓	B1	For sight of 44850.
(Tax on first £35000 =) (£)7000	✓	B1	For sight of 7000.
(Additional Tax =) 0·4 × (£)9850 = (£)3940	✓ ✓	M1 A1	F.T. 0·4 × ('their 44850' − 35000).
(Total Tax =) (£)10,940	✓	A1	F.T. 'their 7000' + 'their 3940'.
Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £ , % being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	✓ ✓	QWC 2 7	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident 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.
8. Sight of 1m (being represented by) 10cm AND of 1yd (being represented by) 9cm 1/10 metre = 1/9 yard or equivalent e.g. '1yd = 0·9m' (1 metre =) 1·1(yards)		B1 M1 A1	Allow '1m = 10cm ' or '1yd = 9cm' etc. Allow ± 0·1cm in measurement of 10cm and 9cm. F.T. their line measurements.
9. 60% ≡ (£)192 (Original price) $\frac{192}{60} \times 100$ = (£)320		B1 M1 A1	Accept any indication. Or equivalent e.g. 192 / 0·6.
10. Correct substitution into formula. Making 'Annual Bonus' subject of formula. Using consistent units of '£' or 'pence'. (Annual Bonus =) (£)30.26 or 3026 (p)	✓ ✓ ✓ ✓	M1 m1 m1 A1	Do not penalise 'mixing' units at this stage. Allow missing brackets but not incorrect use of + and −. Allow also (£)30.24 or 3024(p) and (£)30.25 or 3025(p) Allow also (£)30.27 or 3027(p) and (£)30.28 or 3028(p)
11. Strategy to find (Fractional or % or actual) return for either currency. (HK$) 0·95(08..) or 95(·08..%) (Return) (Yen) 0·93(60..) or 93(·60..%) (Return) More is lost on the Yen		M1 A1 A1 A1	E.g. $\frac{11.6}{12.2}$ (×100) or $\frac{127.2}{135.9}$ (×100) OR using £x £x × $\frac{11.6}{12.2}$ or £x × $\frac{127.2}{135.9}$ If x = £100 return = £95(.08) If x = £100 return = £93(.60) F.T. their calculated amounts.

UNIT 1 Higher Tier	✓	Mark	Comments
12. $4 \times \frac{2}{6}$	✓	M1	Or equivalent e.g. × 1/3 or ÷ 3.
$\times \frac{15}{3}$	✓	M1	Or equivalent e.g. × 5 or ÷ 0·2.
= 20/3 (hrs)	✓	A1	C.A.O. or equivalent e.g. 6·66...(hrs). *Alternate presentation.* *Tanks* *Pumps* *Hours* *6* *15* *4* .... M1 for 'two' steps. .... M1 for next 'two' steps. .... *2* *3* ***20/3*** A1 C.A.O.
= 6hrs 40min	✓	A1	(Watch out for compensating errors) F.T. conversion from 'their 20/3' only if an M1 gained and is of equivalent difficulty.
13. Sight of 67·5(m) AND 68·5(m)	✓	B1	Allow B1 for sight of 6750 AND 6850.
Sight of 35·5(cm) AND 36·5(cm)	✓	B1	Allow B1 for sight of 0·355 AND 0·365.
(Least number required) $\frac{6750}{36{\cdot}5}$ or equivalent	✓	M1	F.T. 'their least corridor' / 'their biggest tile'. (*with consistent units used)*
185	✓	A1	Must be a whole number of tiles. Unsupported 184 gains M1A0
(Greatest number required) $\frac{6850}{35{\cdot}5}$ or equivalent	✓	M1	F.T. 'their biggest corridor' / 'their smallest tile'. (*with consistent units used)*
193	✓	A1	Must be a whole number of tiles BUT do not penalise again if already penalised once before. Unsupported 192 gains M1A0 If no M marks gained, allow SC1 once for a 'correct' method but using 'mixed' units, e.g. 67·5/36·5.
Both parts, (a) and (b) marked together			
14 (a) $\frac{\text{Angle AOB}}{360} \times 2 \times \pi \times 18 = 66$		M1	For correct substitution.
$A\hat{O}B = \frac{66 \times 360}{2 \times \pi \times 18}$ or equivalent		A1	
$210^{(°)}$		A1	For an answer that rounds or truncates to 210.
(b) (Area =) $\frac{150}{360} \times \pi \times 18^2$		M1	F.T. 'their 210'.
$= 424(\cdot 11..)(cm^2)$		A1	Accept values that are correct to 3 sig.fig. SC1 for 593(.76) or 594.
15. Sight of $\pi \times r^2 \times 5$ AND $\frac{1}{3} \times \pi \times r^2 \times 18$	✓	B1	
$\pi \times r^2 \times 5 + \frac{1}{3} \times \pi \times r^2 \times 18$	✓	M1	Allow only if equivalent to kr^2.
$(11\pi r^2) = 1244$	✓	m1	
$r = \sqrt{(1244 / 11\pi}$	✓	A1	Incorrect manipulation of equation is A0,A0,A0.
$r = 6$(cm)	✓	A1	
(Diameter =) 12(cm)	✓	A1	F.T. their radius.

Unit 2 – Foundation Tier

UNIT 2 (Non-calculator) Foundation Tier	Marks	Comments
1 (a) (i) 6043	1	
1 (a) (ii) thirty two thousand (and) five	1	
1. (b) (i) 36 and 54	1	
1. (b) (ii) 45	1	Allow 45 + 36 (=81)
1. (b) (iii) 42	1	
1. (c) (i) 45700	1	
1. (c) (ii) 46000	1	
1. (d) (i) 24	1	
1. (d) (ii) 27	1	
1. (d) (iii) 23 OR 29	1	For either or both with no incorrect answers
2. g(rams) m(etres) km l(itres) OR cm^3 OR ml OR cc	 1 1 1 1	**Allow incorrect spelling as long as comprehensible** **Note: the contents of a bracket are not required** **If more than one answer given, they all have to be correct.** **e.g. miles, kilometres gets 0** e.g. allow g OR gram OR grams allow m OR metres allow kilometre but not kilo
3. (a) Trapezium Rectangle Rhombus Square	B4	**B1 for each** **B0 for any shape that is in at least 2 places**
3. (b) (i) Correct line with no incorrect lines 	1	
3. (b) (ii) 2 correct lines with no incorrect lines 	1	

UNIT 2 (Non-calculator) Foundation Tier	Marks	Comments
4. (a) 40	1	
4. (b) (i) Add eleven (to the previous term)	B1	Accept +11 Accept any equivalent statement.
4. (b) (ii) Divide (the previous term) by two	B1	Accept ÷2 Accept any equivalent statement.
4. (c) (i) 7 OR −7	1	Allow 7·0 etc. Do not accept 7×7 OR 72.
4. (c) (ii) 0·09	1	Allow ·09
4. (d) 80/100 × 60 = 48	M1 A1	Any correct method for finding 80% SC1 for 48%
5. (a) (i) (£) ½b OR equivalent	1	Ignore units, no £ sign required. Do not accept words, e.g. half of b, 50% of b B0 for 1/2b OR b – b/2
5. (a) (ii) x + 4 (cm) OR 4 + x	1	Ignore units, no cm required. Ignore x=, for example, B1 for x = x+4, x+4=x B1 for x+4=4x, but B0 for 4x=x|+4
5. (b) 8	B2	B1 for 52/4 or 13 OR B1 for 'their 13' – 5 Accept embedded answers like 8+5=13×4=52
5. (c) 5(n + 6)	B2	Ignore x= etc B1 for 5. n+6 (No bracket). B0 for 5n + 6 B1 for n + 6 × 5 but B0 for n + 30 But n+6 = 6n × 5 gets B0. Also n+6(5) gets B0 Penalise –1 for inappropriate algebra if B2
Overlay (viewed with diagram) 6. All 3 quadrants correct 	B3	B1 for each correct quadrant.

UNIT 2 (Non-calculator) Foundation Tier	Marks	Comments
7. Indirect (✓) marking		
For trying to find the costs of a common number of bricks	S1	
For example: Davies 40 bricks cost (£) 6 × 4	M1	Method of finding the cost of common number of bricks from either Davies or Jones
= (£) 24	A1	for first correct cost,
Jones 40 bricks cost (£) (£) 20	A1	for the other.
Profit on a common number of bricks	B1	Finding the profit
How many bricks for a profit of (£)20	B1	F.T. their common number of bricks costs.
OR	S1	For trying to find the cost of 1 brick
Davies' bricks cost 600/10	M1	Method of doing it for Davies or Jones
= 60p each	A1	for first correct cost,
Jones' bricks cost 50p each	A1	for the other.
Davies gains 10p per brick	B1	Finding the profit
They sold 200 bricks	B1	F.T. their common number of bricks costs.
Look for • Spelling • Clarity of text explanations • The use of notation – watch for '=','£', 'p' being used appropriately.	QWC 2	
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		QWC2 Presents material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1 Presents material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation and grammar.

UNIT 2 (Non-calculator) Foundation Tier	Marks	Comments	
Both parts (a) – (b) marked at the same time 8. (a) Completed card numbers 2, (3), 4, 5 and 2, 4, (5), 6 6 | 12 18 24 30 (5) | 10 (15) 20 25 (4) | 8 12 16 20 2 | 4 6 8 10 | 2 (3) 4 5	B1 B2	C.A.O. F.T. their table, particularly if they write the column and/or row values in a different order to the mark Scheme B1 for 2 or 3 correct columns OR 2 or 3 correct rows.	
View with table from (a) 8. (b) (i) 9/16	B2	F.T. their table B1 for a numerator of 9 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 "9 out of 16", "9 in 16" OR "9:16". When fraction and wrong notation seen, DO NOT penalise wrong notation.
8. (b) (ii) 7/16	B1	F.T. 1− 'their (b)(i)' if a fraction < 1	
Overlay (viewed with diagram) 9. Correct rotation	B2	B1 for anticlockwise about (1,4) OR Clockwise about (4,1) OR a near miss B0 if all 4 rotations shown	
10.(a) Sight of 35° or 65° in appropriate working (or on diagram) 115°	M1 A1	 May be on the diagram	
10.(b) x +3x + 5x = 180, 9x = 180 or other suitable method (x =) 20(°) (3x =) 60(°) **and** (5x =) 100(°)	M1 A1 B1	 FT their x for their 3x and 5x. May be on the diagram	

UNIT 2 (Non-calculator) Foundation Tier	Marks	Comments
11. Split into 2 triangles, or 4 when using a centre point Making use of 180° as angle sum of a triangle $2 \times 180° = 360°$ or $4 \times 180° - 360° = 360°$	B1 B1 B1	*If diagram with angles torn to then meet at a point gets B1 B1 B0.* *If only square or rectangle considered, i.e. $4 \times 90°$ is $360°$ award B1 B1 B0,* *Or if only square or rectangle considered with angles discussed but no sizes given, then B1, B0, B0,* *Or angles of $90°$ with implication of '4' sides or angles, B0, B1, B0* *If a candidate quotes '180 (n – 2)' with n =4 substituted to get 360 then B2,* *OR for quoting '180(n – 2) then B1,* *However, if '180(n-2) is explained, based on number triangles, then probably B1, B1 , B1.* *Remember: if a special case quadrilateral is considered then maximum B2.* *If MR and working to show exterior angles $360°$ then for equivalent work treat as MR-1*
12.(a) $4x + 20 – 6x + 12$ $= -2x + 32$	B1 B1	FT until 2nd error
12. (b) y^{14}	B1	
12.(c) $3b > 27$ $b > 9$	M1 A1	27/3 must be evaluated If '=' used but replaced to give b>9 then M1,A1, otherwise no marks SC1 for b>31/3 but do not ignore incorrect cancelling

Unit 2 – Higher Tier

UNIT 2 (Non-calculator) Higher Tier	Marks	Comments
1.(a) Sight of 35° or 65° in appropriate working (or on diagram) 115°	M1 A1	May be on the diagram
1.(b) x +3x + 5x = 180, 9x = 180 or other suitable method (x =) 20(°) (3x =) 60(°) **and** (5x =) 100(°)	M1 A1 B1	FT their x for their 3x and 5x. May be on the diagram
2. Correct rotation	B2	B1 for anticlockwise about (1,4) OR Clockwise about (4,1) OR a near miss B0 if all 4 rotations shown
3.(a) Sight of 49 or 16 from correct working Sight of 49 – 16 with 33 shown	M1 A1	*Or: 49.2804 – 15.21, both must be correct M1* *(34.0704) rounded to 33 A1* *Or: (7+4)(7-4) or unrounded difference of 2 sq M1* *Followed by 11×3 = 33 A1*
3. (b) Correct interpretation of 6 ¼%, e.g. sight of (25/4)/100 or sight of 6.25/100, or 0.0625 or 6 ¼ /100 6 ¼ / 100 × 40 or 0.0625 × 40 or sum of appropriate percentages (£)2.5(0)	B1 M1 A1	Or splitting percentages correctly with correct place values, but not showing the sum A method that could lead to a correct response
3. (c) 1 / 2.5 or similar evidence of understanding of term reciprocal 2/5 or 0.4 or 10/25 or equivalent	M1 A1	Do not accept answer as a decimal within a fraction
3. (d) -11xy -14y +4x	B1	Do not ignore further working. Mark final answer.
4. Deciding of possible outcomes HH TT HT TH P(TT) = ¼ Conclusion that the statement is true (¼ < ½)	M1 A1 A1	Or calculation P(TT) = ½ × ½ shown
5.(a) 4x + 20 – 6x + 12 = - 2x + 32	B1 B1	FT until 2nd error Mark final answer
5.(b) y^{14}	B1	
5.(c) 3b > 27 b > 9	M1 A1	27/3 must be evaluated If '=' used but replaced to give b>9 then M1,A1, otherwise no marks SC1 for b>31/3 but do not ignore incorrect cancelling

UNIT 2 (Non-calculator) Higher Tier	Marks	Comments
6. Split into 2 triangles, or 4 when using a centre point Making use of 180° as angle sum of a triangle $2 \times 180° = 360°$ or $4 \times 180° - 360° = 360°$	B1 B1 B1	*If diagram with angles torn to then meet at a point gets B1 B1 B0, with maximum QWC2* *If only square or rectangle considered, i.e. $4 \times 90°$ is $360°$ award B1 B1 B0,* *Or if only square or rectangle considered with angles discussed but no sizes given, then B1, B0, B0,* *Or angles of $90°$ with implication of '4' sides or angles, B0, B1, B0* *AND maximum QWC1because the communication is only for a special case* *If a candidate quotes '180 (n – 2)' with n =4 substituted to get 360 then B2,* *OR for quoting '180(n – 2) then B1,* *AND maximum QWC1* *However, if '180(n-2) is explained, based on number triangles, then probably B1, B1 , B1 with QWC2 available* *Remember: if a special case quadrilateral is considered then maximum B2 and QWC1* *If MR and working to show exterior angles $360°$ then for equivalent work treat as MR-1*
QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps with a statement that the angle sum of a triangle is 180° within their response **AND** • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps with a statement that the angle sum of a triangle is 180° within their response **OR** • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC 2	QWC2 Presents <u>relevant</u> material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1 Presents material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.
7.(a)(i) Any two points calculated or plotted correctly, with no incorrect points, OR a correct straight line but may have an extra incorrect point plotted Points joined by one straight line	M2 A1	Otherwise M1 for any single correct point, not simply an intersection with an incorrect line, or from an incorrect calculation ((0,6) (1,4.5) (2,3) (3,1.5) (4, 0)) Single straight line, do not ignore incorrect points joined *If 1 error in manipulating the equation then penalise -1, then FT. More than 1 manipulative error gets no marks.*
7.(a)(ii) -1.5 or equivalent	B1	
7.(b) B D E in this order (y =5x y - 3x = 4 x + y – 5 = 0)	B3	B1 for each correct answer

UNIT 2 (Non-calculator) Higher Tier	Marks	Comments
8.(a) 7 000 000 ÷ 4 = 1 750 000 1.75×10^6	M1 A1 B1	 FT if M1 awarded, and equivalent difficulty SC1 for 2.8×10^7
8. (b) 2/3 × 24.6 (million) 16.4 (million) or 16 400 000 16 million or 16 000 000 or 1.6×10^7	M1 A1 B1	Ignore place value in initial calculation ISW from 16.4 (million), but if incorrect place value then B0 FT their 2/3 of 24.6 provided M1 awarded. Do not ignore place value, i.e. 16 gets B0
9.(a) $6x^2 + 9x - 10x - 15$ $6x^2 - x - 15$	B2 B1	B1 for any 3 correct terms FT from B1 provided there is a term in x^2. Mark final answer
9.(b) Method to eliminate a variable First variable correct Method to find 2nd variable Second variable	M1 A1 M1 A1	Allow 1 slip (not in matched variable) **x = -3** FT their 1st variable **y = 10**
		FT until 2nd error
9.(c) $3t = 5d - dt$ $3t + dt = 5d$ $t(3 + d) = 5d$ $t = 5d / (3 + d)$	M1 M1 M1 A1	Expansion of bracket within any step Collect terms in t Factorise for t Only FT for equivalent difficulty, must have factorised
10. Cyclic quadrilateral opposite angles total 180° <BAD = 180 –x As an appropriate 2nd stage: angle at the centre is twice the angle at the circumference <BOD = 2(180 – x) OR <BOD = 360 – 2x convincing	M1 M1 M1 A1	'Cyclic quadrilateral' is insufficient, however… If 180-x seen, this implies 'opposite angles total 180', so if 'cyclic quadrilateral' stated previous M1 can be awarded (Accept '2 × 180 –x' for 2(180 – x)) Final A1 depends on all previous M marks *Alternative:* If 'reflex angle at the centre is used, then angles at the point' M1 reflex angle at the centre is twice the angle at the circumference M1 Reflex <BOD = 2x, may be implied in words if given finally algebraically M1As an appropriate 2nd stage: Angles at a point sum is 360 A1 360 – 2x convincing (Final A1 depends on all previous M marks)
11.(a) x = 0.0343434… and 100x = 3.434… with an attempt to subtract, OR equivalent (e.g. 1000x – 10x) 34/990 or equivalent	M1 A1	OR 3.4/99 Mark final answer
11.(b) $45 - 3\sqrt{5}\sqrt{2} + 3\sqrt{5}\sqrt{2} - 2$ 43 **and** rational	B2 B1	B1 for the 45 or the -2 CAO
12. Deciding on a strategy, either tree diagrams or appropriate terms P(BB') + P(B'B) or equivalent $\frac{15}{20} \times \frac{5}{19} + \frac{5}{20} \times \frac{15}{19}$ must show no replacement 150/380 or equivalent	S1 M1 m1 A1	 Or equivalent (For information: P(YB)=45/380, P(RB)=30/380) ISW

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