

GCSE MARKING SCHEME

MATHEMATICS - WALES PILOT

NOVEMBER 2010

INTRODUCTION

The marking schemes which follow were those used by WJEC for the November 2010 examination in GCSE MATHEMATICS - WALES PILOT. 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.

PAPER 1 – FOUNDATION TIER

2010 Autumn Paper 1 (Non calculator)		POST CONFERENCE MARK SCHEME (14/11/2010)
Wales Pilot Foundation Tier	Marks	Comments (Page 1)
1. (a) (i) Thirty five thousand two hundred and seventy	B1	C.A.O.
six		
(ii) 16340	B1	C.A.O.
(b) (i) 28 and 62	B1	C.A.O.
(ii) 43	B1	C.A.O.
(iii) 42	B1	C.A.O.
(iv) 8	B1	C.A.O.
(v) 64	B1	Accept 8 ²
(c) 8	B1	Accept 8×3 OR 3×8
		x
(d) (i) 7680	B1	C.A.O.
(ii) 8000	B1	C.A.O.
	10	
2. g(rams)	B1	C.A.O.
cl OR mm ³ OR cm ³ OR cc OR ml	B1	C.A.O.
m(etres)	B1	C.A.O.
m^2	B1	C.A.O.
	4	
3 (a) Lines	B1	САО
Curve	B1	C.A.O.
(b) Line of symmetry on lizard	B1	C.A.O.
4 lines of symmetry	B2	B1 for at least 2 lines of symmetry with up to 1 incorrect line.
	5	
4. A should be nearer $\frac{1}{4}$ than 0 or $\frac{1}{2}$	B1 for	Accept 2, 4 and 5 instead of A, B and C respectively
B should be between $\frac{1}{2}$ and $\frac{3}{4}$	each	
0 1	3	
5. (a) Wednesday	B1	C.A.O.
(b) 4	B1	C.A.O.
(c) 1	B1	C.A.O.
(d) 31	B1	C.A.O.
(e) 5	B1	C.A.O.
	5	
6. (a) 124 36		
$\times 36$ OR $\times 124$	M1	Any correct complete method for the multiplication of 124 by
744 144		36.
<u>3720</u> 720	A1	For either 744 or 3720 OR any 2 of 144, 720 and 3600
4464 <u>3600</u>		(Apply 'one error' in other methods)
4464	A1	Place value errors get M0, A0, A0
4464		C.A.O.
(b) $1/5 \text{ of } 40 = 8$ AND 8×2	M1	Any valid method. Allow M1 for $2/5 \times 40$
= 16	A1	C.A.O.
(c) $1\% \text{ of } 400 = 4 \text{ AND } 6 \times 4$	M1	Any valid method. Allow M1 for $6/100 \times 400$
= 24	A1	C.A.O.
	7	

2010 Autumn Paper 1 (Non calculator)		POST CONFERENCE MARK SCHEME (14/11/2010)
Wales Pilot Foundation Tier	Marks	Comments (Page 2)
7. (a) $8.4 - 8.8$	B1	8.6 ± 2 mm
(b) EF	B1	C.A.O.
(c) BE (1) (i) 52 - 56 (ii)	BI	C.A.O.
(d) (1) $52 - 56$ (°) (ii) $154 - 159$ (0)	BI	$54^{\circ} \pm 2^{\circ}$
(11) 154 - 158 (*)	DI D1	$130^{\circ} \pm 2^{\circ}$
(c) Terrect squares $(f) All A correct squares$	B1 B2	-1 for every extra incorrect square
	52	r for every exite meeneer square.
	8	
8. Two rectangles 10 by 4 in correct places	B2	Use overlay B1 for any one correct rectangle OR B1 for a symmetrical pair of rectangles that have an incorrect '4'.
Triangle in a correct place	M1	
Correct triangle	A1	
	4	
9. (a) (i) 3x	B1	Accept $x+x+x$ OR $3\times x$ OR $x\times 3$ OR $x3$
(11) 2x	BI	Accept x+x OR $2 \times x$ OR $x \times 2$ OR $x \times 2$
(b) $3x = 15$	B1	F.T. their (a)(i) = 15
(x = 15/3 ISW (=5)	B1	F.T. their $ax = b (a \neq 1)$
		Allow B2 for answer only of 5
	4	
		<u>Use overlay</u>
10. A line of length 10cm	B1	
A line of length 7cm	BI	The 2 lines must have a common vertex for second B1
An angle of $53 - 57^{\circ}$	BI	Included between 2 sides one of which is 10 or 7
Completed parallelogram	В1 4	
11. (a) (i) 27	B1	Accept 3 ³
(ii) 29, 31	B2	B1 for both with up to 1 incorrect OR B1 for either with no incorrect
(b) (i) 400	B2	B1 for 25 OR B1 for 16
(ii) 3·23	B1	C.A.O.
(iii) (0)·16	B1	C.A.O.
(iv) $5/6 - 4/6$	M1	Any correct method
= 1/6	A1	C.A.O.
12 (-) ((-))((-))	9 D1	
12. (a) 6 (miles)	BI	C.A.O.
(b) 31 (miles)	B1	C.A.O.
(c) 42 (minutes)	B1	C.A.O.
(d) 1451	B1	Accept 2:51 (pm) B0 for 2:51 am OR 02:51
	4	
13. (a) $8 (+) 8 (+) 5$	B1	C.A.O.
(b) 1 box of 5 bars,	B2	B1 for any 3 correct and up to 1 incorrect
1 box of 8 bars,		OR 2 correct and none incorrect
2 boxes of 5 bars OR 10		Ignore repeats
1 box of 5 bars and 1 box of 8 bars OR 13		
(c) $5+5+8=18$ AND $8+8=16$	E2	E1 for a set of trials that include EITHER $5 + 5 + 8 = 18$ OR $8 + 8 = 16$
	5	

2010 Autumn Paper 1 (Non calculator)		POST CONFERENCE MARK SCHEME (14/11/2010)
Wales Pilot Foundation Tier	Marks	Comments (Page 3)
14. (a) Idea of ordered pairs plotted.	M1	Use overlay At least 2 points plotted correctly. Within 2mm of the
At least 5 plotted correctly, not joined.	A1	MR-1 if axes interchanged points on the overlay.
(b) Positive (correlation).	B1	C.A.O.
(c) Line of best fit by eye.	B1	Must have positive gradient, look fit for purpose and have at least 2 points above their line and 2 points below their line.
(d) From their line	B1	F.T. if their line has a positive gradient. Reading should be exact, if the point is on the grid lines, else it should be read to either side of the 2mm square, if the point is inside a square.
	5	
15. Strategy, e.g. drawing other stairs, or sum consecutive numbers	S1	e.g. drawing (1 &) 2 steps, or 4 steps etc.
1 + 2 + 2 + 4 + 5 + (+ 7 + 8 + 0) OP (0.10) /2 OP equivalent	M	
1+2+3+4+3+6+7+8+9 OK $(9x10)/2$ OK equivalent		
45 H1	3	
16 Strategy e.g. 7kg considered	<u> </u>	x hags $5(\frac{1}{2}x) + 2(\frac{1}{2}x) = 336$ or trial and improvement
336 / 7	M1	OR 336/3.5 or correct evaluation either side of 336 total
48 (bags)	A1	
(Total number of bags) 96	Al	FT
H2	4	
17. (a) It's a leading question.	B1	
It shouldn't say "improvements" OR "fantastic"		
(b)(i) What is often? OR They are too vague OR They are not clear OR You cannot get accurate	B1	OR There is no mention of "over what period" OR There is no mention of "Never"
(ii) Some numerical choice	D 2	For an answer that has an exhaustive range of quantitative
(II) Some numerical choice, e.g. 1-3. 4-6 etc. per week	D2	choices over a time period, with no gaps
e.g. 1-5, 4-6 etc per week		Do not penalise use of 0 or 'never'
		B1 for a range of quantitative choices that does not fulfil all
		the requirements for B2.
	4	1
18.(a) Use of $(\frac{1}{4} \text{ m} = 25 \text{ cm and}) \frac{1}{8} \text{ m} = 12.5 \text{ cm}$	S1	start end overnight
OR 1/8 m progress by next morning		Monday 55 30 42.5
Up to start of Wed correct	M1	Tuesday 42.5 17.5 30
	4.1	Wednesday 30 5 17.5
Out during Thursday.	AI	Thursday 17.5 out
(b) 8n – 5	B2	B1 for 8n
Нбас	5	
		<u>Use overlay</u>
19. (i) Angle A bisected, allow $\pm 2^{\circ}$	B1	
(11) Arc 5cm centre A, allow ± 2 mm	BI	
Correct region shaded	BI	F1 from correct intentions
H7	3	
$20 (a) v^6$	B1	САО
(b) $8x + 17 = 3x + 27$	B1	Correctly expanded bracket = $8x+17$ FT until 2^{nd} error
8x - 3x = 27 - 17 OR $5x = 10$	B1	Collect like terms
x = 2	B1	Accept 10/5
Н8ас	4	

PAPER 1 – HIGHER TIER

GCSE Higher Tier Wales Pilot Nov 2010. Paper 1	Mark	Comments
1. Strategy, e.g. drawing other stairs, or sum consecutive	S1	E.g. drawing (1 &) 2 steps, or 4 steps, etc.
numbers		
1+2+3+4+5+6+7+8+9 OR (9x10) /2 OR equivalent	M1	
45	A1	
	3	
2. Strategy, e.g. 7kg considered	S1	x bags, 5 $(\frac{1}{2}x) + 2(\frac{1}{2}x) = 336$ or trial and improve
336 / 7	M1	OR 336/3.5 or correct evaluation either side of 336 total
48 (bags)	Al	
(1 otal number of bags) 96	AI	FI
2 (a) Intention of correct location	4 D1	
All lines X2		Award B1 for any 3 lines v? SCI for an largement
All lines $\wedge 2$	D2	different scale in the correct position
(b) Reflection in the line $x = 2$	B2	B1 for reflection in any vertical or horizontal line
(c) Correct rotation	B2	B1 for clockwise 90° rotation about origin
(d) $360 - (180 - 55)$ or $55 + 180$	M1	
235°	A1	
	9	
4.(a) 24 (km) and 75 (miles)	B3	B2 for either OR B1 for evidence of 5miles to 8 km used
(b) $20/8 \times 5$	M1	Or equivalent in stages
= 12.5 (miles per litre)	A1	
(c)(i) 210 / 6	M1	An answer of 175 implies M1 A0
= (£) 35 saving	A1	
(ii) Liliput Insurance cost $20 + 10 \times 17.50$	MI	Maybe implied in difference in costs statements
$= (\pounds)195$	AI D1	Mariha anan (a)(i)
One month early $\cos t = (t, t) \frac{1}{5}$		Maybe seen (C)(1) E1 depends on M1 eworded in (ii)
Advice stated, e.g. No, pay early saving (1)55 of (1)20	LI	Δ ccent Ves with reason that Keyin can't nay early and
	11	then new company saves (£)15
5.(a) 33.5 (mm)	B1	
(b)(i) $30 \times 3 + 35 \times 2 + 80 \times 1$	M1	90 + 70 + 80 (= 240)
Intention their $\sum fx / 6$	M1	(240/6)
- 40 (mm)	A1	
(ii) Modal class 30 mm	B1	Accept class 27.5 to 32.5
Median 32.5 mm	B1	
(iii) Average selected with a reason, e.g.	E1	
mean because uses all data, mode as it shows the most	-	
common, median as it is the middle. $f(a)$ Use of $(1/m = 25 \text{ am and}) \cdot \frac{1}{9} \text{ m} = 12.5 \text{ am}$	/ S1	
$O(a)$ Use of $(\frac{74}{11} - 25 \text{ cm} \text{ and})$ $1/8 \text{ m} - 12.5 \text{ cm}$	51	
Un to start of Wed correct	M1	
Out during Thursday.	Al	
(b) -5, -2, 3	B2	B1 1^2 -6, 2^2 -6, 3^2 -6 OR any two terms correct
(c) $8n - 5$	B2	B1 for 8n
(d) $3(n+4)$	B2	B1 for $n + 4 \times 3$ missing brackets, or $3n+4$ or $n+4(\times 3)$
	9	
7.(i) Angle A bisected, allow $\pm 2^{\circ}$	B1	
(11) Arc 5cm centre A, allow ± 2 mm	B1	
Correct region shaded	BI	FT from correct intentions
$\frac{8}{2}$ (a) y^{6}	D1	
$(b) x^4 + 5x$	R7	B1 for each term If B2 penalise further incorrect work -1
(c) $8x + 17 = 3x + 27$	B1	Expand bracket FT until 2 nd error
8x - 3x = 27 - 17 OR $5x = 10$	B1	Collect like terms
x = 2	B1	Accept 10/5
	6	-
9.(a) Correct frequency polygon	B2	B1 if translated OR joined with curve OR one plot
		incorrect
(b) $14, 38, 74, 80$	B1	
(c) Labelled suitable uniform scales	B2	BI suitable scales OR labelled uniform scales but \leq is included
Plotting at the bounds	R1	Includeu FT their cumulative table only if cumulative
Accurate plots joined with a curve or line	R1	Allow 1 error
(d)(i) Median =	B1	
(ii) Idea UO – LO, with an attempt at readings	M1	
Interquartile range accurate for their graph	A1	
	10	

GCSE Higher Tier Wales Pilot Nov 2010. Paper 1	Mark	Comments
10.(a)(i) 1/49	B1	
(ii) 1	B1	
(b) 15	B1	
(c) (i) 3.5×10^7	B1	
(ii) 1.3×10^{-5}	B1	In (c) only SC1 for consistent notation problem
(d) 4×10^{12}	B2	B1 for x 10^{12}
(e) 2/3 alone	B1	
(f) Either improper fraction correct and attempt to	M1	
multiply $(8/3 \times 11/4)$		
= 88/12	A1	
$=7^{1}/_{3}$	A1	Accept 22/3
	11	
11. $3g + 2d = 32$ and $4g + 3d = 44$	M1	Alternatively: $1 \text{ goose} + 1 \text{ duck} = 12 \text{ (kg)}$
Equate coeffs., allow 1 slip OR alternative	M1	2 geese + 2 duck = 24 (kg)
Weight of goose or duck correct, $g = 8$ or $d = 4$	A1	1 goose ($= 32 - 24$) = 8 (kg)
Method to find second weight	M1	1 duck = 12 - 8
Other correct weight	A1	= 4 (kg)
2 geese + 1 duck = 20 (kg)	B1	20 (kg)
	6	Or other alternative strategy
12. Use of the y values 24, 21, 16, 9 and 0 with area	M1	
Use of trapezium rule or idea of sum areas	M1	
58	A1	CAO
	3	
13. $4/5 \times 7.5$ OR $(\sqrt{16} / \sqrt{25}) \times 7.5$	M2	M1 for use of 16/25 as a scale factor or sight of 4/5
6 (cm)	A1	
	3	
$14.(a) \ 100^{\circ}$	B1	
Explanation (Angles in cyclic quad. & angle at the centre)	E1	Depends on B1 or FT from 260
(b) 78°	B1	
Explanation (Alternate segment theorem)	E1	Depends on B1
	4	
15. (a) y α 1/x OR y = k/x	B1	
5 = k/2	M1	FT non linear only
y = 10/x	A1	Maybe implied in part (b)
(b)		
x -4 2 50	B2	FT their non linear expression
y -2.5 5 0.2	5	B1 for each value, do not accept 10/-4 for -2.5
16.(a) x=-7, x=-3, x=1	B2	B1 for any two correct. Allow -71. to -7
(b) $y = -30x + 60$ drawn	M1	
Intersection x approximately 1.4 to 1.5	A1	
	4	
17. Approximately 233° or 307°	B1	
Then: Approximately 307° or 233° with no other values	B1	FT 540 – first answer
	2	
18.(a) Correct sketch (shift left)	B1	
Correct sketch with $(-5, 0)$ indicated	B1	SC1 for shift right with 1 indicated
(b) Reflection (in <i>x</i> -axis)	B1	Allow for reflection in any horizontal line
Correct reflection and (0, -6) indicated	B1	
	4	
19.(a) $(3 - x)(x - 5)$	M1	As a <u>common denominator</u>
8(x-5) - 2(3-x)	M1	Not necessarily seen as a numerator
$\frac{10x - 46}{10x - 46}$	A1	CAO. Further incorrect working gives A0
(3 - x)(x - 5)		
(b) $10x - 46 = 0$ OR showing multiplication	M1	FT candidate's single fraction, equivalent level of
(3 - x)(x - 5) throughout by $(3 - x)(x - 5)$		difficulty.
10x - 46 = 0	M1	
x = 46/10 ISW	Al	Depends on both M marks.
	6	NO marks for $10x - 46 = (3 - x)(x - 5)$

PAPER 2 – FOUNDATION TIER

2010 Autumn Paper 2		FINAL POST CONFERENCE MARK SCHEME
Wales Pilot Foundation Tier	Marks	Comments (21/11/2010) (Page 1)
1. (a) 272 (p)	B1	C.A.O.
(f) = (f) = (f)	B1	CAO
$f_{6.53} OR 653p$	B1	F.T. for one error
	21	
(b) $4 \times (f) 438$	M1	
= (f)1752	A1	CAO
(Change =) (f) 2.48	R1	$FT_{f20} = $ 'their 17.52'
(Chunge) (2)2.40	6	1.1. 220 then 17.52
2(a)(0).5	B1	$C \land O$
$\frac{2}{6/10}$	B1	OR equivalent
(0).4(0)	B1	C A O
(0) = (0) (0) = (0)	B1	F T their figures
0 /2 +0/0	DI	1.1. then figures
(b) (i) $4/9$	B1	CAO
(ii) 5/9	B1	$FT_1 = \text{'their (i)'}$
(11) 5/5	DI	
	6	
$3_{1}(a) 440(g)$	B1	C.A.O.
(b) Pointer at 440 g	B1	F.T. 'their (a)'
(c) 650	B1	C.A.O.
380	B1	C.A.O.
= 270 (g)	B1	F.T. their readings if one correct
	5	
4. (a) Evidence of square counting	M1	e.g. dots in the squares
46-54	A1	
460 - 540	B1	F.T. their area \times 10
(b) radius	B1	C.A.O.
chord	B1	C.A.O.
	DI	
(c) hexagon	BI	C.A.O.
cone	B1	C.A.O.
cuboid	Bl	C.A.O.
	8	
5. (a) Amount paid = $15.50 \times 6 + 56$	M1	For correct substitution
$=(\pounds) 149$	Al	C.A.O.
(b) Number of hours = $(118 - 56)/15.5(0)$	MI	For correct substitution and division
Number of hours $= 4$	AI	Allow embedded references to the correct answer.
	Λ	
6 Man 5 to 7 ft OP 1.5 to 2.5 matrice	4 D1	Award the R1g on gight of man's height and goals faster than
U. Wall 3 to 1.5 cm Vacht length $= 12$ cm	DI	use the diagram below to belo in awarding the M1 A1
Multiplying factor = $8 \text{ to } 0.25$	P 1	ase the diagram below to help in awarding the WIT, AT
Estimate vecht's length $=$ men estimate v factor	DI M1	F.T. their man's height estimate AND scale factors 5–11 inc.
Estimate yacht s length $-$ man estimate \times factor	IVII	
F.1. man's neight estimate \times their SF (5 – 11 inc.)		
= correct answer for their figures	A1	Correct units must be seen at least once to get the final A1
		<u>Unsupported answers</u> marked as
IF B0, B0, M0, A0 awarded then		fallowo:
SC1 for answers which:		feet 25 40 64.75 77
EITHER (a) only give man's height between $1 \text{ cm} \& 1.5$		
cm and yacht's length as $12 \text{cm} \pm 2 \text{mm}$		metres 12
OR (b) a proper attempt at 'dividing' the yacht's		12 27.5
length into equal parts	4	

2010 Autumn Paper 2 Walsa Bilet Foundation Tion	Manlar	FINAL POST CONFERENCE MARK SCHEME
wales Phot Foundation Her7 $Adulte$ (f) $A85 \pm A85$ (070)	DIARKS	Comments (21/11/2010) (Page 2)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	R1	of the table gets MR_1
Sea view $5 \times 4 \times 10$ (200)	B1	of the table gets when i.
$\begin{array}{c} \text{Balconv} & 3 \times 4 \times 10 \end{array} \tag{200}$	B1	SC1 for (£) 80 OR (£)32 but not (£)8 (1 error)
Total (£)1798	B1	F.T. for one error
	5	
	-	Penalise – 1 for using different letter. Condone capitals
8. (a) (i) $x - 5$ (years)	B1	C.A.O. (Ignore units)
(ii) $\mathbf{\underline{r}} + 8$ (metres)	B1	C.A.O. (Ignore units)
(iii) 12t	B1	Accept 12×t OR 12×t OR t12
(b) 49	B2	B1 for 27 OR 22
(c) (i) $(x=)$ 11	B1	Accept embedded answers such as $11 - 4 = 7$
(ii) (y=) 72	B1 7	<u>Accept embedded answers such as $72/6 = 12$</u>
9. (a) Sum of the numbers (408)	M1	For attempt to add the numbers
Sum/8	ml	For dividing a number in the range 320 – 490 inc by 8.
51	A1	C.A.O.
(b) 65	B1	C.A.O.
(c) 19 28 36 <u>52 56</u> 61 72 84	M1	For arranging the numbers in order
= 54	A1	C.A.O.
10. Other side = $60/12$	M1	
= 5	A1	
Perimeter = $5 + 5 + 12 + 12$	M1	F.T. 'their 5'.
= 34 (cm)	A1	
	4	
11. (a) $odd + odd + odd = odd$ and 50 is even	E1	Along these lines
(b) For example, multiply by 4	E1	Along these lines
(c) For example, 2/5 is 4/10	E1	Along these lines
	3	
12. 3 or 4 angles correct and correctly labelled.	B4	Use the overlay and allow $\pm 2^{\circ}$.
		Correct labels (Letter/word NOT the frequency OR angle).
	D2	3 correct labels is enough.
3 or 4 angles correct, labels not fully correct.	B3 D2	Accept labels in the form of a key.
2 angles correct labels not fully correct	R2	
1 angle correct and correctly labelled	B1	
	21	If B0 scored for the diagram, check the angles and the method
OR		to see if the M1 and the A1 can be awarded.
		1 is $1\frac{1}{2}^{\circ}$ gets the M1.
If 0 OR 1 for their diagram or no diagram,	M1	If only B1 is scored for the diagram, and all the angles given
360/240 Angeles and 144, 06, 78 and 42	A 1	correctly, then cancel the B1 and award M1, A1 for 2 marks.
Angles are 144, 96, /8 and 42	AI	UK SCI for all percentages: 40, 26-7, 21-7, 11-7 rounded OR truncated
	4	

2010 Autumn Paper 2		FINAL POST CONFERENCE MARK SCHEME
Wales Pilot Foundation Tier	Marks	Comments (21/11/2010) (Page 3)
13. Strategy, locating 3 OR 4 points	S2	S1 for locating any 2 points
(5,1) $(5,5)$ $(-3,1)$ $(-3,5)$	B2	B1 for any 2 correct coordinates
	4	
14. (a) 13	B2	B1 for any 3 correct
7 9		
5 7		
(b) 3/12 <u>ISW</u>	B2	F.T. their table
		B1 for 3 as numerator in a fraction < 1
		B1 for the 12 as denominator in a fraction < 1
		<u>Penalise –1 for incorrect notation such as 3:12, 3 out of 12,</u>
15 1000 - 110	4	<u>3 in 12 etc.</u>
15. 1200×1.16		
= 1392	AI D1	C.A.U. E.T. rounding up their enginer to peerest 10 eurog
1400 dollars	DI	r.1. Tounding up then answer to hearest To euros
$Cost = (1400 \div 1.16)$	M1	F T 'their 1400' only if they have rounded or truncated 'their
		1392' to the nearest 10 euros
= (£) 1206.89	A1	Accept (£) 1206.90
	5	Any answer less than £1200 gets A0.
$16 (a) x = 78^{\circ}$	B1	
$v = 25^{\circ}$	B1	
$z = 77^{\circ}$	B1	
(b) 360 /5	M1	
72 (°)	A1	
H1	5	
17. Strategy, largest digits used, $9?? \times 7?$ OR $7?? \times 9?$	S1	
Digits in ???? and ?? in descending order	MI	
$/41 \times 93 \ (= 68913)$		
$\frac{13}{18} (a) 6x 4x - 20 \pm 8$	2 B1	ET until 2 nd error
16. (a) $0x - 4x - 20 + 8$ 2x = 28	B1	F1 ultil 2 elloi
x = 14	B1	Accept $x = \frac{28}{2}$
(b) $12(y+3)$	B2	B1 for partially factorise OR $12(y +)$ OR $12(+3)$
H4	5	
19. (a) 152.5(0)	B1	Or correct 20% of any of their values
Overall method 2 yr compound reduction	M1	OR B1, M2 for 762.5(0) x 0.8^2
762.5(0) - 152.5(0) = 610, 610 - 122	M1	Increase compound or simple interest possible B1 only
$=(\pounds) 488$	Al	C.A.O. As their final answer.
(b) $(Saving = 762.5-610 + 762.5-488 = \pm 427)$	E2	ET their velue for averall service
YES as saving $\pm 427 > \cos \pm 500$	EZ	F 1 their value for overall saving. E1 States saving f_{427} but not stated comparison with (f)300
reduced price of fuel		OR E1 for comparing (762.5 \pm 488) with (f) 300
H9	6	
20. (a) Correct substituted Pythag. $AB^2 = 3.4^2 + 7.1^2$	M1	$AB^2 = 11.56 + 50.41$
$AB^2 = 61.97$	A1	
$AB = 7.872 \dots$ rounded or truncated	A1	Accept 7.8 OR 7.9
H11a	3	
21. (a) $4n < 11$	B1	C.A.O.
n < 11/4	B1	C.A.O.
4.) 2	D1	E.T. a mained and different
(0) 2	BI	F.I. equivalent difficulty
	3	
	5	

PAPER 2 – HIGHER TIER

GCSE Higher Tier Wales Pilot Nov 2010. Paper 2	Mark	Comments
$\frac{1}{1} (a) x = 78^{\circ}$	B1	
$v = 25^{\circ}$	B1	
$z = 77^{\circ}$	B1	FT 180 - x - y
(b) $360/5$	M1	11100 x-y
(0) 50075 72 (°)	A 1	
72()	5	
$2 4 \times 6 \times \text{height} = 72 \text{ or equivalent}$	J M1	
2. $4 \times 0 \times \text{neight} = 72$ of equivalent height = 2 (cm)	A 1	Sight of 2
Correct method finding the area of the ared OP 12 \times 10	M1	ET their height $(6 \pm 2h)$ and $(4 \pm 2h)$
Confect method finding the area of the card, OK 12 \times 10 A ros 120 (am ²)	A 1	SC1 for 84
Alea 120 (clif)		SC1 J07 84
2. Strategy largest digits used 022 × 72 OB 722 × 02	4	
5. Strategy, largest digits used, 9?? ~ ?? OK ??? ~ 9? Digits in 222 & 22 in descending order within each	51 M1	
Digits in ??? & ?? in descending older within each		
$741 \times 02 (-69012)$	A1 2	
$\frac{741 \times 95}{41 \times 95} = \frac{20 \times 8}{20}$	3 D1	ET
4. (a) $6x - 4x = 20 + 8$	BI D1	FI unul 2 error
2X - 28	DI D1	$\Lambda = 28/2$
x = 14	BI D2	Accept $x = 28/2$ D1 correctly fortanized but not with LICE
(0) 12 $(y + 3)$	D2	DI confectity factorised but not with ΠCF
5 (a) Entries 95459	J D2	$\frac{OK}{12} (y + \dots) OK \frac{12}{(\dots + 3)}$
5. (a) Entries 8 5 4 5 8 (b) \mathbf{P}_{1}	B2	BT for any 5 correct entries
(b) Points plotted correctly	MI	F I their values, allow I error for MI
Joined with a curve	AI D1	FI their values
(c) (0, 4)	BI	F I from their graph
	3	Constitution 1 shirt MD 1 and FT
	2.01	Considering I shirt, MR-1 and F1
6. (a) 12% of $(/x9./5)$ OR 88% of $(/x9./5)$	MI	Sight of 8.19 (or 60.06)
Shirts cost (£) 60.06	AI	
Started with $(\pounds) 80$	AI	F1 their $68.25 - 8.19^{\circ} + 19.94$ provided M1 awarded
(b) $2.75/250$ and $1.20/110$	MI	OR $\frac{2}{5}$ and $\frac{120}{110}$ working in pence
(t)1.1(0) and $(t)1.09(09)$ per 100ml	AI	1.1 and 1.09 (p) per 1ml
OR 0.011 and 0.0109 (p) per Iml		$OR Green 2.75/250 \ x110 \ M1 \ 1.21 \ for 110ml \ A1$
	F 1	Red $1.20/110 \times 250 \text{ MI} 2.72(72)$ for 250 ml AI
Red justified from previous working	EI	Depends on M1 awarded
((about) Ip per 100ml cheaper OR equivalent for other	(
quantities compared)	0	
7. (a) Use of πr^2 with $r = 7.3$	MI	D 1 4 4 167
16/(.415cm)	AI	Rounds of truncates to 167
(b) Use of πd with d=12.8 or $2\pi r$ with r = 6.4	MI	P 1 () () ()
40(.212 cm)	AI	Rounds or truncates to 40
	4	
8. 2007, 7 nights $125 \times 7 / 1.27$	MI	A
= (t) 688.98	AI M1	Accept $088.9/01 088.9/03 01 089.()$
2008 room rate 8% of 125 + 125 euros		OR could be \times /
135 (euros)	AI M1	OK 945 (euros)
2008 , / nights $155 \times / / 1.15$		F 1 increased room rate provided ivi 1 for 2008 rate
=(t) 830.28	AI D1	Accept 830.()
Increase is (1) 147.50	BI	F I provided at least M2 or 52 awarded
		Only consider 1 night: 2007 (f) 96.45 S1,2008 (f) 110 47 S1 (f) 21 04 D1 Alao possible MI A1
	7	2008(L) 119.47 S1, (L)21.04 B1. <u>Also possible M1 A1</u> as hefene for 2008 no un rate (Mau ⁵ marka)
(1, 1, 2, 2, 5, 0)	/ D1	<u>as bejore for 2008 room rate</u> (Max3 marks)
7. (a) 152.5(0) Overall method 2 up compound reduction		OF COLLECT 20% OF any OF their values OP = P1 = M2 for 762 5(0) = 0.9 ²
Overall method 2 yr compound reduction $762.5(0) = 152.5(0) = 610 = 610 = 122$	M1	UR B1, M2 10F /02.5(0) X 0.8
702.3(0) - 132.3(0) - 010, 010 - 122	111	As their final answer
- (f) A00	A 1	As uten mai answer.
- (L) 400	AI	
(b) VES as solving $f_{427} > cost f_{200}$	E2	ET their value for everall sering
OP NO with reason based on locking at one wear at a	E2	F1 then value for overall saving.
time e g it was worth it the first year but not in the		274.50 is the total savings in the 2^{nd} may E0
second year	6	277.50 is the total savings in the 2 year E0
second year		

GCSE Higher Tier Wales Pilot Nov 2010. Paper 2	Mark	Comments
10. (a) $q - 6 = 5t$	B1	FT until 2 nd error
t = (q - 6) / 5	B1	
(b) $y = 0$	B1	
y = -6	B1	
(c) $(x-3)(x-7)(=0)$	B2	B1 for $(x 3)(x 7)$
x = 3 and $x = 7$	BI D1	F1 from their pair of brackets
(d) $4 + 12 > /11 - 511$ OK $511 - /11 > -12 - 4$	DI R1	F I ultill second elloi Accent $n < 16/2$ Do not accent $n > 8$ Mark final
	9	answer
11. (a) Correct substituted Pythag. $AB^2 = 3.4^2 + 7.1^2$	M1	$AB^2 = 11.56 + 50.41$
$AB^2 = 61.97$	A1	
$AB = 7.872 \dots$ rounded or truncated	A1	
(b) $5.6 \times \sin 32 =$	M2	M1 for $sin32 = DF/5.6$
2.9675 rounded or truncated	A1	
(c) $\tan x = 13.4 / 3.7$	M1	
$3.62162 \text{ OR } \tan^{-1}(13.4/3.7)$	A1	
x = 74.564 rounded or	Al	CAO
truncated	9	
12 (a) Any two lines drawn correctly ($y=8$ $y=2x+5$ $y=-$	B2	
$\begin{array}{c} 12. (a) \text{rmy two mics drawn concerny (y 0, y 2x+3, x - 3) \end{array}$	B1	CAO
Correct region identified	3	
	-	
13. (a) All correct entries	B2	B1 for 2 pairs of branches correct
(b) 0.6×0.4	M1	FT from their tree
$0.6 \times 0.4 + 0.6 \times 0.4$	MI	
= 0.48	AI 5	
14 (a) 200	B3	Allow B1 for one correct area or B2 for any three
1(u) 200	23	correct areas. $(30+40+50+40+40)$
(b) (i) 20 (seconds)	B1	
(ii) Correct histogram	B2	Frequency densities 4.5, 5.5, 6.5, 2.5, 0.5 . Allow B1 for
	6	one error (in f.d. or bars)
$15 (a) 9.1/6.5 \times 11.5 \text{ OR } 1.4 \times 11.5$	M1	Or equivalent
16.1 (cm)	Al	On a minut
(0) $0.3/9.1 \times 10.5$ OK $10.5/1.4$		Or equivalent
7.5 (CIII)	4	
16.(a) $(3x+2)(5x+6) = 56$	M1	
$15x^2 + 10x + 18x + 12 = 56$	A1	
$15x^2 + 28x - 44 = 0$	A1	From convincing working
(b) $x = \{-28 \pm \sqrt{(28^2 - 4x 15x - 44)}\} / 2x 15$	M1	Allow 1 slip
$\mathbf{x} = \{ -28 \pm \sqrt{3424} \} / 30$	A1	CAO
1.02 and -2.88	A1	CAO
(c) Only use of 1.02 and $5x + 6$	M1	FT provided M1 in (b)
11.1 (cm)	A1	
$17(2) 0/25 \times 0/24$	8 M1	
$7/(a) \frac{9}{23} \times \frac{8}{23} = 0.12$		
(b) $3/25 \times 8/24$	B1	
$3/25 \times 8/24 + 8/25 \times 3/24 (= 1/25 + 1/25)$	M1	Overall strategy Correct values for probabilities
= 2/25 (0.08)	Al	Ignore incorrect final cancelling throughout
	5	
18. Strategy, sine then cosine rule	S1	
$BD/\sin 82 = 7.8/\sin 35$ OR equivalent	M1	
$BD = \sin 82 \times 7.8 / \sin 35$	A1	
BD = 13.4665 rounded or truncated	Al	
$CD^{2} = 18.3^{2} + BD^{2} - 2 \times 18.3 \times BD \times \cos 69$ $CD^{2} = 220.6 - 4\pi - 240.07$	Ml	FT their BD
CD = 339.0 to $340.0/$	AI A1	
CD = 10.4(, CIII)	7	
	1 '	

GCSE Higher Tier Wales Pilot Nov 2010. Paper 2	Mark	Comments
19. (a) $\frac{1}{2}\left(\frac{4}{3}\pi \mathbf{r}^{3}\right) = 7\pi$	M2	$\frac{4}{3}\pi \mathbf{r}^{3} = 7\pi$ Without considering ¹ / ₂ , M1
$\mathbf{r}^3 = \frac{7 \times 3 \times 2}{4} \qquad \mathbf{r}^3 = \frac{42}{4}$	A1	FT A0 for sphere $r^3 = 7 \times 3 / 4$
Radius = 2.189 cm	A1	CAO But A1 full sphere $r = 1.738$
(b) Strategy, e.g. to find area 1/6 or $\frac{1}{2}$ hexagon $\frac{1}{2} \times 4 \times 4 \times \sin 60$ OR $4^2 = h^2 + 2^2$, h=3.464 together with $\frac{1}{2} \times (2 \text{ or } 4) \times 3.464$ Area 1/6 hexagon = 6.9282 OR 1/12 hexagon 3.464 Cross section area 41.5692 (cm ² rounded or truncated) Volume 831.38 (cm ³ rounded or truncated)	S1 M1 A1 A1 A1 9	Use of 8 instead of 4, MR-1 then FT

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