

Mark Scheme (Results)

November 2011

GCSE Mathematics (1380)
Paper 2F

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NOTES ON MARKING PRINCIPLES

1 **Types of mark**

M marks: method marks

A marks: accuracy marks

B marks: unconditional accuracy marks (independent of M marks)

2 **Abbreviations**

cao – correct answer only

isw – ignore subsequent working

oe – or equivalent (and appropriate)

indep - independent

ft – follow through

SC: special case

dep – dependent

3 **No working**

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

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

4 **With working**

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

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

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

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

5 **Follow through marks**

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

6 Ignoring subsequent work

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

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

7 Probability

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

8 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

10 Money notation

Accepted with and without the "p" at the end.

11 Range of answers

Unless otherwise stated, when any answer is given as a range (e.g. 3.5 – 4.2) then this is inclusive of the end points (e.g. 3.5, 4.2) and includes all numbers within the range (e.g. 4, 4.1).

1380_2F					
Question		Working	Answer	Mark	Notes
1	(a)		4.3	1	B1 cao
	(b)		24	1	B1 cao
2	(i)	17 55 + 1 20 Or 17:55 + 5min = 18:00 18:00 + 1 hr = 19:00 19:00 + 15 min = 19:15	19 15	3	M1 for 17 55 + 1 20 oe or a complete build up method or 1875 or 1835 A1 for 19 15 , 7 15 pm oe
	(ii)	18 34 – 17 55	39		B1 ft 19:54 – ‘19 15’
3	(a)		0.89, 1.2, 7.01, 13.1	1	B1 cao
	(b)		-8, -3, 0, 2, 6	1	B1 cao
	(c)		$15 - 4 \times (2 + 1) = 3$	1	B1 for $15 - 4 \times (2 + 1) = 3$ oe
4	(a)		(-4, 3) (0, -2)	2	B1 cao B1 cao
	(b)		(-2, 0.5)	2	B2 or ft from (a) [B1 ft for (-2, y) or (x, 0.5) or (0.5, -2) or $\left(\frac{-'4'+ '0'}{2}, \frac{'3'+ '-2'}{2} \right)$]
5			6 105° 16	3	B1 cao B1 105° accept without degree sign tol ±2° B1 cao

1380_2F																						
Question		Working			Answer	Mark	Notes															
6		$6 \times 6 - 4 \times 2$			28 cm^2	2	B1 cao B1 for cm^2 oe															
7	(a)				8	1	B1 for $8 \text{ cm} \pm 2 \text{ mm}$															
	(b)				50°	1	B1 for an angle in the range 48° to 52°															
	(c)				Overlay	1	B1 for angle drawn within guidelines [Allow an angle of 130° accurately drawn anywhere]															
8	(a)	<table border="1"><thead><tr><th>Country</th><th>Tally</th><th>Frequency</th></tr></thead><tbody><tr><td>England</td><td> </td><td>5</td></tr><tr><td>Ireland</td><td> </td><td>1</td></tr><tr><td>Scotland</td><td> </td><td>10</td></tr><tr><td>Wales</td><td> </td><td>2</td></tr></tbody></table>	Country	Tally	Frequency	England		5	Ireland		1	Scotland		10	Wales		2				2	M1 for attempting a tallying process A1 for a fully correct tally chart [SC If M0 then B1 for a fully correct frequency column]
	Country	Tally	Frequency																			
England		5																				
Ireland		1																				
Scotland		10																				
Wales		2																				
(b)	Bars of height 5, 1, 10 and 2			2	B2 or ft for a fully ‘correct’ bar chart [B1 ft for 1 ‘correct’ bar]																	

1380_2F					
Question		Working	Answer	Mark	Notes
9	(a)		$\frac{5}{12}$	1	B1 cao
	(b)		0.375	1	B1 cao
	(c)	$\frac{9}{24}, \frac{10}{24}, \frac{7}{24}, \frac{4}{24}$ compared to $\frac{6}{24}$ OR 0.37(5, 0.41(6..., 0.29(166..., 0.16(6.. compared to 0.25 OR 37(.5)%, 41.(6...%, 29.(1..%, 16.(6....)% compared to 25%	$\frac{7}{24}$	2	M1 for attempting to convert at least 3 fractions to equivalent fractions with the same denominator at least 3 correct A1 for $\frac{7}{24}$ oe OR M1 for attempting to convert at least 2 fractions to decimals or percentages with at least 2 correct rounded or truncated to 2SF A1 for $\frac{7}{24}$ oe Note – the correct answer with less than the required working scores 0 marks
10	(a)		6p	1	B1 cao
	(b)		4m	1	B1 cao

1380_2F					
Question		Working	Answer	Mark	Notes
11	(a)		3, 15, 75	2	B2 for all 3 correct [B1 for 1 or 2 correct]
	(b)		Straight line from the origin to (100, 150)	2	M1 for a straight line drawn from (0,0) or which when produced would pass through (0,0) A1 for a single line from the origin to (100, 150) tol 1 sq (SC If M0 then B1 for plotting any two points correctly ft table)
	(c)		65 to 68	2	B2 65 – 68 Or M1 for a horizontal line from 100 drawn to meet the graph oe A1 ft tol 1 sq OR M1 for $100 \div 1.50$ A1 for 65 - 68
12	(a)		93	1	B1 cao
	(b)	99 – 90	9	2	M1 for 99 – 90 A1 cao [SC: B1 for ‘90 to 99’ if M0 scored]
	(c)	Sum of the 10 durations $\div 10$	94.1	2	M1 for $(95+91+98+93+93+90+92+99+97+93) \div 10$ or for the sum of 9 durations $) \div 10$ A1 cao

1380_2F					
Question		Working	Answer	Mark	Notes
13	(a)	$20 \div 4$	5	1	B1 cao
	(b)	9×3	27	1	B1 cao
14	(i)		6	3	B1 cao
	(ii)		5		B1 cao
	(iii)		9		B1 cao
15		$5.08 - 1.24 \times 3 = 1.36$ $1.36 \div 2$	£0.68 or 68p	3	M1 for 1.24×3 or 3.72 oe seen M1 for $(5.08 - '3.72') \div 2$ oe A1 for £0.68 or 68p Accept £0.68p
16			15 6 28 49 8 19 4 31 23 25 32 80	3	B3 for a fully correct table [B2 for 3, 4 or 5 correct entries] [B1 for 1 or 2 correct entries]
17		$360 - (62 + 136 + 90) = 360 - 288 = 72$ $180 - 72$	108	3	M1 for $360 - (62 + 136 + 90)$ or 72 seen M1 for $180 - '72'$ A1 cao
18			At least 6 shapes (inc given shape)	2	B2 for at least 6 tessellating shapes (may inc given shape) with no gaps and no extra isolated shapes drawn [B1 for at least 4 tessellating shapes (may inc given shape) drawn, with no gaps]

1380_2F					
Question		Working	Answer	Mark	Notes
19	(a)	$4.636809..... \div 3.44$	1.3479(09665...)	2	M1 for 4.63(6809..... or 3.44 seen or $3\frac{11}{25}$ or $\frac{88}{25}$ A1 for 1.3479(0....
	(b)		1.35	1	B1 ft for 1.35
20		$\frac{3500 \times 2.5 \times 3}{100}$	262.50	3	M2 for $\frac{3500 \times 2.5 \times 3}{100}$ A1 262.50 (Accept 262.5, 262.50p) or M1 for $\frac{3500 \times 2.5}{100}$ oe M1 for '87.5' x 3 A1 262.50 (Accept 262.5, 262.50p) A1 262.50 (Accept 262.5, 262.50p) [SC: B2 for 3762.50 if M0 scored [SC: if M0 then B2 269.12 or 269.11] [SC:if M0 then B1 3769.12 or 3769.11]

1380_2F					
Question		Working	Answer	Mark	Notes
21	(a)(i)		1, 2, 3, 5, 6, 10, 15, 30	3	B2 for including all factors (-1 for any extra factors quoted) [B1 for at least 4 correct factors with no extra incorrect ones]
	(ii)		6		B1 cao
	(b)		60	2	M1 for at least 4, 8, 12 and 5, 10, 15 and 6, 12, 18 A1 cao or M1 for $2 \times 2 \times 3 \times 5$ or 2, 2, 3 and 5 identified A1 cao SC : B1 for any other common multiple of 60

1380_2F					
Question		Working	Answer	Mark	Notes
22	(a)	$2x - 10 + x + 50$ (ext angle of a triangle = sum of int opp angles) OR $180 - (2x - 10 + x + 50) = 140 - 3x$ (sum of the angles in a triangle = 180) $180 - (140 - 3x)$ (sum of the angles on a straight line = 180)	Shown with reasons	3	M1 for $2x - 10 + x + 50$ B1 for 'ext angle of a triangle = sum of int opp angles' A1 for completing the algebra to complete the proof to $y = 3x + 40$ OR M1 for $180 - (2x - 10 + x + 50)$ or $140 - 3x$ seen B1 for 'sum of the angles in a triangle = 180° ' oe and 'sum of the angles on a straight line = 180° ' oe A1 for completing the algebra to complete the proof to $y = 3x + 40$
	(b)(i)	$3x = 145 - 40 = 105$ $105 \div 3$	35	4	M1 for $3x = 145 - 40$ A1 cao
	(ii)	$35 + 50 = 85$ $2 \times 35 - 10 = 60$ $180 - 145 = 35$	85		M1 $2 \times 35 - 10$ or ' 35 ' + 50 or $180 - 145$ or 60 or 85 A1 ft for 85
23		$\frac{6^7}{6^4}$ or $6^1 \times 6^2$ or $\frac{6^5}{6^2}$	6^3	2	M1 for $\frac{6^7}{6^4}$ or $6^1 \times 6^2$ or $\frac{6^5}{6^2}$ or 6^{7-4} or 6^{5-2} or $6 \times 6 \times 6$ A1 cao [SC: B1 for 216 if M0 scored]

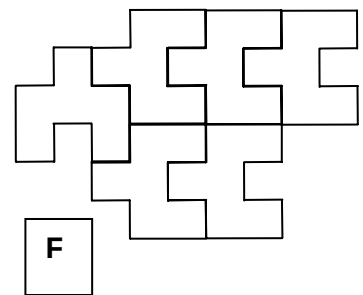
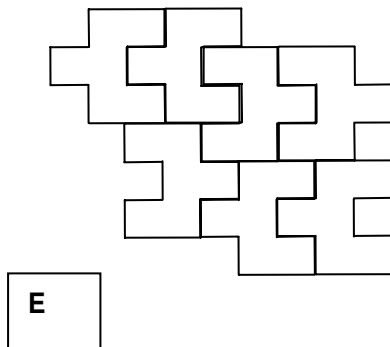
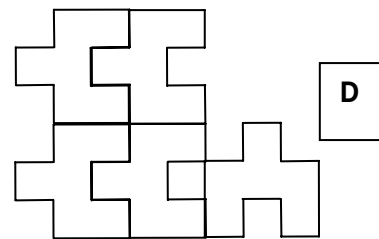
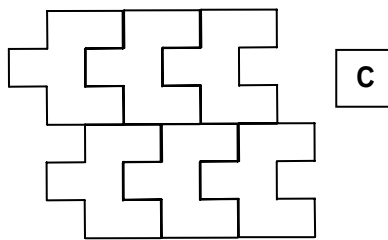
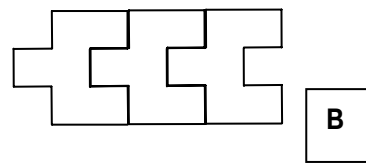
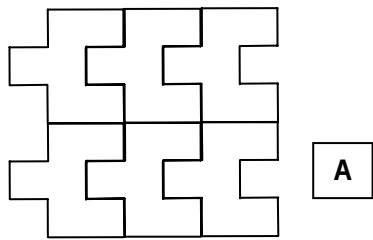
1380_2F					
Question		Working	Answer	Mark	Notes
24	(a)		-2, -1, 0, 1, 2, 3, 4	2	B2 for 7 correct integers [-1 for each incorrect integer] [B1 for 6 correct integers and none incorrect]
	(b)	$x(x-3) + 5(x-3)$ $= x^2 - 3x + 5x - 15$ OR $\begin{array}{r rr} \times & x & +5 \\ x & x^2 & 5x \\ -3 & -3x & -15 \end{array}$	$x^2 + 2x - 15$	2	M1 for $x(x-3) + 5(x-3)$ or $x(x+5) - 3(x+5)$ or 3 correct terms out of 4 from $x^2 - 3x + 5x - 15$ or the 4 terms $x^2, 3x, 5x, 15$ (irrespective of sign) A1 for $x^2 + 2x - 15$
25	(a)	140×1.12 Or $\frac{12}{100} \times 140$ $140 + '16.80'$	156.80	3	M2 for 140×1.12 oe A1 156.80 (Accept 156.8, 156.80p, 156.8p) Or M1 for $\frac{12}{100} \times 140$ M1 (dep) $140 + '16.80'$ A1 156.80 (Accept 156.8, 156.80p, 156.8p) Or M1 for a build up method with correct figures M1 $140 + 16.8(0)$ A1 156.80 (Accept 156.8, 156.80p, 156.8p))
	(b)(i)		10.5	2	B1 cao
	(ii)		11.5		B1 for 11.5 (accept 11.499(9999...))

1380_2F					
Question		Working	Answer	Mark	Notes
26		$2800 \div (13 + 12 + 10) = 80\text{p / share}$ $80 \times 12 = 960$ $960 \times \frac{2}{3}$	6.40	4	M1 for $2800 \div (13 + 12 + 10)$ or $28 \div (13 + 12 + 10)$ M1 for '80' $\times 12$ (=960) or '0.80' $\times 12$ (=9.6(0)) or 10.40, 1040, or $\frac{12}{35} \times 28$ or $\frac{12}{35} \times 2800$ M1 (indep) for '9.6' $\times \frac{2}{3}$ oe or '960' $\times \frac{2}{3}$ oe A1 for £6.40 or 640 pence [accept 6.4] SC : B2 for answer of 10 supported by working
27	(a)		Overlapping boxes Not exhaustive No time period stated	2	1 st aspect : no time frame 2 nd aspect : overlapping boxes 3 rd aspect : not exhaustive boxes ie. no < 1 B2 for 2 aspects (B1 for 1 aspect)
	(b)		Example: "How many hours a day do you listen to music" 0 to3, over 3 to 5, over 5	2	1 st aspect : question including time frame and units (or question and time frame and units in response boxes) 2 nd aspect : at least 3 boxes – all non-overlapping with discrete values or a range; need not be inclusive of all or a set of at least 3 boxes which are exhaustive for all integer numbers of hours (but which may overlap) B2 for 2 aspects (B1 for 1 aspect)

1380_2F					
Question		Working	Answer	Mark	Notes
28		$12^2 = h^2 + 6^2$ $h = \sqrt{144 - 36} = 10.392$ Area = $\frac{1}{2} \times 6 \times 10.392$	31.18	4	M1 for $12^2 = h^2 + 6^2$ or $12^2 - 6^2$ M1 for $\sqrt{144 - 36}$ (=10.3(92 M1 (indep) for $0.5 \times 6 \times '10.392'$ A1 for 31.17 to 31.18
29		$(100 \div 12) \times (50 \div 12) = 8 \times 4$ whole CDs	36	2	B2 32, 33, 34, 35 36 Or accept M1 for $(100 \div 12) \times (50 \div 12)$ oe A1 32 Or accept B1 44

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Examples of tessellation



A – 2 marks

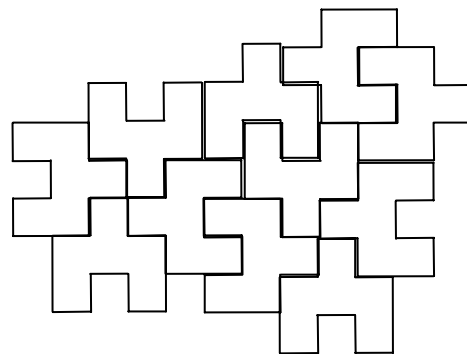
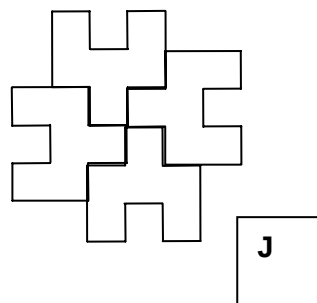
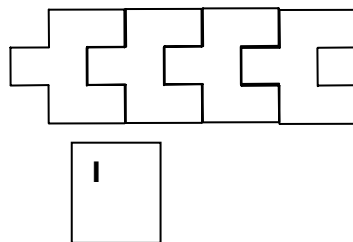
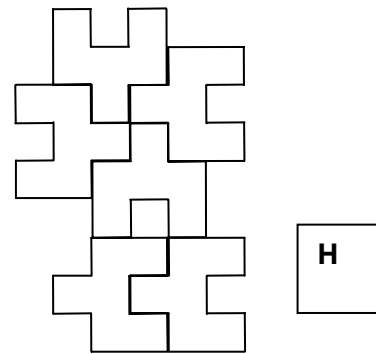
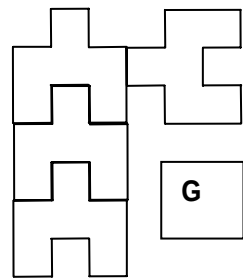
B – 0 marks

C – 2 marks

D – 1 mark

E – 2 marks

F – 1 mark, as it does not show how it would tessellate



G – 0 marks

H – 1 mark

I – 1 mark

J – 1 mark

The figure on the right shows a less obvious tessellation and justifies/explains the inclusion of J

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