Mark Scheme (Results)

March 2012

GCSE Mathematics (1380) Foundation
Paper 2F (Calculator)

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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	ft – follow through
isw – ignore subsequent working	SC: special case
oe – or equivalent (and appropriate)	dep – dependent
indep – independent	

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 a 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)		Five thousand and seventy six	1	B1 ignore spellings
	(b)		12 507	1	B1 accept mixture of digits and words for correct answer
	(c)		73 000	1	B1 accept answer in words
	(d)		700	1	B1 accept answer in words
2	(a)		8.5 cm	2	M1 for numerical answer in the range 8.3-8.7 or 83-87 (ignore incorrect units) or 8-9 with cm or 80-90 with mm A1 for answer 8.3-8.7 cm or 83-87 mm
	(b)		Obtuse angle	1	B1 for obtuse, ignore spelling
	(c)		145º	1	B1 for 145º ± 2º
3			Kilogram Litres inches	1 1 1	B1 for kg or kilograms B1 for litres or *l* B1 for inches

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Question		Working	Answer	Mark	Notes
4	(a)	Red 7 Blue 5 White 4 Grey 4	Correct frequencies	2	B2 for all frequencies correct (B1 for 2 tallies or 2 frequencies correct)
	(b)		Correct bars	2	B2 ft for all bar heights correct with or without gaps (B1 ft for 2 bar heights correct; also for completely correct bar-line graph or polygon.)
	(c)		Red	1	B1 ft
5	(a)		× near ½	1	B1 for cross near ½
	(b)		× at 0	1	B1 for cross at 0
	(c)		× near ¼	1	B1 for cross near ¼
6		$17 - 5 = 12$ $12 \div 2 =$ $2x + 5 = 17$ $2x = 17 - 5$	6	3	M1 $17 \div 2$ (=8.5) or $17 - 5$ (=12) M1 for correct order of operations −5 then ÷ 2 A1 cao **Alternative** M1 for forming the equation $2x + 5 = 17$ M1 for attempt to subtract 5 from both sides or divide both sides by 2 as the first step A1 cao **NB** For solutions involving trial and improvement award 3 marks (B3) for the correct answer of 6 but 0 marks for method; embedded solutions get 2 marks as long as the equation or working is complete.

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Question		**Working**	**Answer**	**Mark**	**Notes**
7	(a)(i)		(4, 3)	1	B1 cao
	(ii)		(–4, –2)	1	B1 cao
	(b)		Correct cross at (–2, 3)	2	B2 for correctly placing the cross at (–2, 3) (B1 for a cross at (–2, y) or at (x, 3)
8	(a)		A and C	2	B2 for both correct in either order (B1 for one correct)
	(b)		B and D	2	B2 for both correct in either order (B1 for one correct)
9		Examples: $7 \times 1 - 2 = 5$ (trial) $7 \times 3 - 2 = 19$ (trial) $7 \times 5 - 2 = 33$ (counter example)	Show rule breaks down	2	M1 for testing the rule for one odd number with a correct evaluation A1 for showing that the rule breaks down for 5 or 11 or any other counter example

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Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)		$4a$	1	B1 cao
	(b)		$2a + 7b$	2	B2 accept equivalents (B1 for $2a$ or $7b$ accept equivalents; ignore signs)
	(c)		4	1	B1 cao
	(d)		12	1	B1 cao
	(e)	$2t = 3 - 8$ $2t = -5$ $t = -5 \div 2$	-2.5	2	M1 for showing attempt to subtract 8 from both sides or divide both sides by 2 as the first step A1 for -2.5 accept $\dfrac{-5}{2}$ oe
11	(a)		12, 11	2	B1 for first number as 12 B1 for second number as11
	(b)		41	2	M1 for $4n+1$ seen in (b) or $4\times10+1$ or attempt to count on from 21 with at least three 4's added correctly A1 cao
	(c)		$4n + 1$	2	M1 for $4n+k$ where $k \neq 1$ or is absent A1 for $4n + 1$ NB: $n=4n+1$ B1

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Question		Working	Answer	Mark	Notes
12		2 × 55 = £1.10 4 × 28 = £1.12 1 × £4.95 Total = £7.17	£2.83	4	M1 for either 2 × 55 (=£1.10) or 4 × 28 (=£1.12) oe M1 for attempt to total for three different items M1 for attempt to take their total away from £10 with consistent units A1 cao **Alternative** M1 for either 2 × 55 (=£1.10) or 4 × 28 (=£1.12) M1 for attempt to subtract one item from £10 M1 for attempt to subtract three different items from £10 with consistent units A1 cao **SC** B2 for £4.22
13	(a)	2 × 6 + 2 × 4 12 + 8	20	2	M1 for 2 × 6 + 2 × 4 A1 for 20
	(b)	24 = 2×l + 2×3	9	2	M1 for substituting 24 and 3 into the formula or sight of 18 A1 for 9 **Alternative** M1 for 2l = P – 2w or sight of 24 – 2×3 A1 for 9

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Question		**Working**	**Answer**	**Mark**	**Notes**
14	(a)		London	1	B1 accept 7
	(b)		Aberdeen	1	B1 accept –9
	(c)		10	1	B1 accept -10
	(d)		Aberdeen and Dublin	1	B1 accept –9 and –5
15	(a)	6, 8, 12, 18, 19, 24	15	2	M1 for arranging in order or for answer of 12 or $\dfrac{12+18}{2}$ or $\dfrac{18+6}{2}$ A1 cao
	(b)	$(24 + 8 + 18 + 6 + 12 + 19) \div 6 = 87 \div 6 =$	14.5	2	M1 for adding the 6 numbers **and** dividing by 6 or sight of $87 \div 6$ or 71.16…. A1 oe
	(c)	$16 \times 7 = 112$ $112 - 87$ or $(16\text{-}14.5)=1.5$ $1.5\times6+16=$	25	2	M1 ft for $16 \times 7 - $ "87" or increases the 6 marks by 1½ A1 for 25 or ft from (b)
16	(i)	$360 - (140 + 90)$	130	2	M1 for $360 - (140 + 90)$ A1 for 130
	(ii)		reason	1	B1 for <u>angles</u> at a <u>point</u> add to <u>360</u>

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Question		**Working**	**Answer**	**Mark**	**Notes**
17		$250 \times \dfrac{4}{100} = £10$ $£10 \times 3$	£30	3	M2 for $\dfrac{250 \times 4 \times 3}{100}$ oe (M1 for $250 \times \dfrac{4}{100}$ oe or sight of 10) A1 for £30 cao **SC** B2 for £280
18	(a)	350×1.34	469	2	M1 for 350×1.34 or digits 469 A1 cao
	(b)	$67 \div 1.34 = 50$ $50 - 47.50$ OR $47.50 \times 1.34 = 63.65$ $67 - 63.65 = 3.35$ $3.35 \div 1.34 =$	2.50	3	M1 for $67 \div 1.34$ or 50 seen M1 (dep) for "50" – 47.50 A1 for 2.5(0) **OR** M1 for $47.5(0) \times 1.34$ or 63.65 or 3.35 seen M1 (dep) for 67 – "63.65" (= 3.35) **and** "3.35" $\div$ 1.34 A1 for 2.5(0)
19	(a)		Correct reflection	2	M1 for a correct reflection in any line A1 for a correct reflection in the *y* axis
	(b)		Correct enlargement	2	M1 for enlarging 2 adjacent sides correctly or correct enlargement using incorrect scale factor ($\neq 1$) A1 cao
20	(a)		048º		B1 for correct bearing measured within tolerance of ±2º
	(b)		Bearing drawn	2	B1 for correct bearing of 150º drawn tolerance of ±2º B1 for correct distance of 6 cm ± 2 mm

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Question		Working	Answer	Mark	Notes
21	(a)	$\dfrac{\sqrt{6.25 + 3.75}}{2.2}$ $\dfrac{\sqrt{10}}{2.2}$	1.4373(98936...)	3	B3 for 1.4373(98936...) or 1.4374 (B2 for answer of $\dfrac{5\sqrt{10}}{11}$ or sight of $\sqrt{10}$ or 3.162… or 1.43 or 1.44 or 1.437) (B1 for sight of 2.2 or 10)
	(b)		1.44	1	B1 for 1.44 (or ft from part(a) provided (a) is given to at least 3 decimal places).
22		$x = 3$ gives 36 $x = 4$ gives 76 $x = 3.1$ gives 39.(091) $x = 3.2$ gives 42.(368) $x = 3.3$ gives 45.(837) $x = 3.4$ gives 49.(504) $x = 3.5$ gives 53.(375) $x = 3.6$ gives 57.(456) $x = 3.7$ gives 61.(753) $x = 3.8$ gives 66.(272) $x = 3.9$ gives 71.(019) $x = 3.15$ gives 40.7(05875) $x = 3.16$ gives 41.0(34496) $x = 3.17$ gives 41.3(65013) $x = 3.18$ gives 41.6(97432) $x = 3.19$ gives 42.0(31759)	3.2	4	B2 for trial $3.1 \le x \le 3.2$ (B1 for trial $3 \le x \le 4$) B1 for a different trial $3.15 \le x < 3.2$ B1 (dep on at least one previous B1) for 3.2 Accept trials correct to the nearest whole number (rounded or truncated) if the value of x is to 1 dp but to 1dp (rounded or truncated) if the value of x is to 2 dp NB: no working scores no marks, even if the answer is correct. All trials must be evaluated.

1380_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
23		$16^2 - 8^2 = 192$ $\sqrt{192} = 13.85640646$	13.86	3	M1 for showing the intention to square and attempt to subtract or sight of $16^2 - 8^2$ or 192 M1 for $\sqrt{(256 - 64)}$ or $\sqrt{192}$ or $8\sqrt{3}$ A1 for answer in range 13.85 to 13.86
24	(a)	$1 - (0.15 + 0.25 + 0.20 + 0.16)$	0.24	2	M1 for $1 - (0.15 + 0.25 + 0.20 + 0.16)$ or $1 - 0.76$ A1 for 0.24 oe
	(b)	300×0.25	75	2	M1 for 300×0.25 A1 cao
25		$5 \times 2 = 10$ $15 \times 8 = 120$ $25 \times 9 = 225$ $35 \times 7 = 245$ $45 \times 4 = \underline{180}$ 780 $780 \div 30 = 26$	26	4	M1 for finding fx consistently within intervals including the end points (allow 1 error) M1 (dep) for use of all correct mid-interval values M1 (dep on first M1)for $\sum fx \div \sum f$ A1 cao

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