

Mark Scheme (Results)

November 2012

GCSE Mathematics (2MB01) Foundation  
5MB3F (Calculator) Paper 01

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## NOTES ON MARKING PRINCIPLES

- 1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- 2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- 3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- 4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- 5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- 6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:
  - i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*  
Comprehension and meaning is clear by using correct notation and labeling conventions.
  - ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*  
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.
  - iii) *organise information clearly and coherently, using specialist vocabulary when appropriate.*  
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

## **8 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.

## **9 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.

**10 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.

**11 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.

**12 Parts of questions**

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

### 13 Range of answers

Unless otherwise stated, when an 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)

#### **Guidance on the use of codes within this mark scheme**

M1 – method mark

A1 – accuracy mark

B1 – Working mark

C1 – communication mark

QWC – quality of written communication

oe – or equivalent

cao – correct answer only

ft – follow through

sc – special case

dep – dependent (on a previous mark or conclusion)

indep – independent

isw – ignore subsequent working

5MB3F_01					
Question		Working	Answer	Mark	Notes
1	(a)		0.25	1	B1 cao
	(b)		$\frac{3}{4}$	1	B1 oe
	(c)		20	1	B1 cao
2	(a)		hexagon	1	B1 hexagon
	(b)		pentagon	1	B1 pentagon
	(c)		A and H	1	B1
3	(a)	125 + 16	£141	2	M1 125 + 16 A1 cao SC B1 for 144 (the cost of Coat and Shirt)
	(b)	50 – 3 = 47 28 + 19	Jeans and Shirt	3	M1 50 – 3 M1 for a pair of items with total price < 50 or a pair of item prices with total < 50 A1 Jeans and Shirt
4			reflected shape	2	B2 correct T shape drawn in correct position (B1 correct reflection in a line parallel to the mirror line)

5MB3F_01				
Question	Working	Answer	Mark	Notes
*5	$18 \times 5.78 = \text{£}104.04$ $20 \times 5.64 = \text{£}112.80$ $104.04 > 112.80$	Fred's DIY Store $104.04 > 112.8(0)$	3	M1 $18 \times 5.78$ or $20 \times 5.64$ A1 (£)104.04 and (£)112.8(0) or £8.76 C1 (dep on M1) for correct conclusion based on comparison of their two answers. (Accept working in £ or p)
6	(a) $150 - 10 + 25 = 165$ $165 - 5 + 16$  Or $150 - 5 + 16 = 161$ $161 - 10 + 25$  OR $150 - 15 = 135$ $135 + 41$  Or $150 + 41 = 191$ $191 - 15$  OR $10 + 5 = 15$ $25 + 16 = 41$ $41 - 15 = 26$ $150 + 26$	176	3	M1 $150 - 10 + 25$ or 165 M1 "165" - 5 + 16 A1 cao Or M1 for $150 - 5 + 16$ or 161 M1 for or "161" - 10 + 25 A1 cao  OR M1 $150 - 10 - 5$ or $150 - 15$ or 135 M1 "135" + 25 + 16 or "135" + 41 A1 cao Or M1 for $150 + 25 + 16$ or $150 + 41$ or 191 M1 for "191" - 10 - 5 or "191" - 15 A1 cao  OR M1 $10 + 5$ or 15 or $25 + 16$ or 41 $25 + 16 - 10 - 5$ or 26 M1 for $150 + "41" - "15"$ or $150 + "26"$ A1 cao



5MB3F_01					
Question	Working	Answer	Mark	Notes	
6	(b)	$\frac{80}{240} = \frac{1}{3}$	$\frac{1}{3}$	2	M1 $\frac{80}{240}$ oe A1 cao SC B1 for $\frac{2}{3}$
7	(a)	$9000 \div 45 = 200$ $200 \div 25$  OR $9000 \div 45 = 360$ $360 \div 45$  OR $25 \times 45 = 1125$ $9000 \div 1125$	8	3	M1 $9000 \div 45 (= 200)$ M1(dep) for “200” $\div 25$ A1 cao  OR M1 for $9000 \div 25 (=360)$ M1 (dep) for “360” $\div 45$ A1 cao  OR M1 $25 \times 45$ or 1125 M1 (dep) for $9000 \div “1125”$ A1 cao
	(b)	$690 \times 25 = 17250$ $17250 + 260 = 17510$ $17510 \div 1000$ 17510	17.51	4	M1 $690 \times 25$ or 17250 M1 (dep) for “17250” + 260 (=17510) M1 (dep on first M1) for “17250” $\div 1000 (=17.25)$ or “17510” $\div 1000$ A1 cao

5MB3F_01				
Question	Working	Answer	Mark	Notes
8	$24 + 24 + 15 = 63$ $63 - 60$	3	4	M2 for $24 + 24 + 15$ or 63 (M1 for $24 + 24$ or $24 + 15$ ) M1 (dep on at least M1) for “63” – 60 or 60 – “63” A1 <b>SC B2</b> for £18 (using 2 adults and 2 children) or for £4 (using £16 for child ticket)
9	(a) $25 \times 9 + 10$  (b) $360 - 10 = 350$ $350 \div 25$	235  14	2  3	M1 $25 \times 9 + 10$ A1 cao  M1 $360 - 10 (=350)$ or $360 \div 25 (=14.4)$ M1 for correct order of operations – 10 then $\div 25$ A1 cao OR M1 reverse flowchart for inverse operations with either $- 10$ or $\div 25$ M1 reverse flowchart for inverse operations with both $- 10$ and $\div 25$ in correct order A1 cao OR M1 $14 \times 25$ M1 $350 + 10$ or $14 \times 25 + 10$ A1 cao

5MB3F_01				
Question	Working	Answer	Mark	Notes
10	$(1 \times 18 + 12 + 2 \times 18) +$ $(10 + 15 + 1 \times 18 + 5)$ $= 66 + 48$ $= 114$  OR $12 + 10 + 15 + 5 = 42$ $1 + 2 + 1 = 4$ $4 \times 18 = 72$ $42 + 72$	Yes they have raised enough money	5	M1 for $1 \times 18 + 12 + 2 \times 18 (=66)$ or Jamie's form completed with correct 18 and 36 and a final total. M1 for $10 + 15 + 1 \times 18 + 5 (=48)$ or Lily's form completed with correct 18 and a final total. M1 "66" + "48" (dep on M1) A1 for 114 C1 (dep on M1) for clear comparison and conclusion using their answer for the total raised  OR M1 for $12 + 10 + 15 + 5 (=42)$ seen separately from any other total M1 for $(1 + 2 + 1) \times 18$ or 72 M1 for "42" + "72" (dep on 2nd M1) A1 for 114 C1 (dep on M1) for clear comparison and conclusion using their answer for the total raised.
11		Correct net	2	B2 any correct net (B1 3 or 4 faces including at least one triangle, but no more than 2 triangles, and one rectangle)
12	(a)	120	1	B1 $120 \pm 2$
	(b)	$5.5 \times 10$	3	B1 $5.5 \pm 0.2$ M1 " $5.5$ " $\times 10$ A1 $55 \pm 2$

5MB3F_01					
Question	Working	Answer	Mark	Notes	
13	(a)		12	1	B1 oe
	(b)		14	1	B1 cao
	(c)	$6y = 42$	7	2	M1 $6y$ or attempting to add $y$ terms, $3y + 3y$ or $y + 5y$ A1 cao
	(d)	$5p = 25$	5	2	M1 for attempt to add 4 to both sides or divide both sides by 5 as the first step. A1 cao
14			diagram	2	B2 8 shapes drawn that tessellate with no gaps (B1 at least 4 shapes drawn, no gaps anywhere)

5MB3F_01				
Question	Working	Answer	Mark	Notes
15*	$1.22 + 0.96 + 2.42 = 4.60$ $1.15 + 0.86 + 2.28 = 4.29$ $4.60 \times 0.95 = 4.37$ $4.37 > 4.29$  OR $1.22 \times 0.95 = 1.159$ $0.96 \times 0.95 = 0.912$ $2.42 \times 0.95 = 2.299$ $1.159 + 0.912 + 2.299 = 4.37$ OR $1.22 \times 0.95 = 1.159$ $0.96 \times 0.95 = 0.912$ $2.42 \times 0.95 = 2.299$ $1.159 > 1.15$ and $0.912 > 0.86$ and $2.299 > 2.28$	no 5% reduction will not be enough	3	M1 $1.22 + 0.96 + 2.42$ or $4.60$ or $1.15 + 0.86 + 2.28$ or $4.29$ A1 $4.37$ and $4.29$ C1 (dep on M1) ft clear statement of comparison based on their answers  OR M1 $1.22 \times 0.95$ oe or $0.96 \times 0.95$ oe or $2.42 \times 0.95$ oe A1 $4.37$ and $4.29$ C1 (dep on M1) ft clear statement of comparison based on their answers  OR M1 $1.22 \times 0.95$ oe or $0.96 \times 0.95$ oe or $2.42 \times 0.95$ oe A1 $115.9$ or $116$ or $115$ <b>and</b> $91.2$ or $91$ or $92$ <b>and</b> $229.9$ or $229$ or $230$ C1(dep on M1) ft clear statement of comparison based on their answers  NB Allow working throughout in pence or pounds
16		overlay	2	B2 within overlay guidelines (B1 for construction arcs 8cm away from each end of given line but point of intersection not joined to this line.)

5MB3F_01				
Question	Working	Answer	Mark	Notes
17*	Paint for You $7.5 \div 2.5 = 3$ tins $3 \times 8.35 = \text{£}25.05$ $25.05 \times 1.20 = \text{£}30.06$ Paul's paints $7.5 \div 0.75 = 10$ tins $10 \times 3.15 = \text{£}31.50$  OR Paint for You $8.35 \times 1.20 = \text{£}10.02$ $10.02 \div 2.5 = \text{£}4.008$ per litre Paul's Paints $3.15 \div 0.75 = \text{£}4.20$ per litre There is no wastage	Paint for You (2.5 litre tins)	4	M1 $7.5 \div 2.5$ or 3 seen or $7.5 \div 0.75$ or 10 seen M1 $8.35 \times 1.2(0)$ oe or 10.02 or " $25.05 \times 1.2(0)$ "oe M1 " $3$ " $\times 8.35$ or " $3$ " $\times$ " $10.02$ " <b>and</b> " $10$ " $\times 3.15$ C1 for both 30.06 and 31.5(0) and correct conclusion  OR M1 $7.5 \div 2.5$ or 3 seen or $7.5 \div 0.75$ or 10 seen M1 $8.35 \times 1.2(0)$ oe or 10.02 or $8.25 \div 2.5 \times 1.2(0)$ oe or $3.34 \times 1.2(0)$ oe M1 " $10.02$ " $\div 2.5$ or 4.008 or 4.01 <b>and</b> $3.15 \div 0.75$ or 4.20 C1 for both 4.008 (or 4.01) and 4.2(0) and correct conclusion  OR M1 $7.5 \div 2.5$ or 3 seen or $7.5 \div 0.75$ or 10 seen M1 $8.35 \times 1.2(0)$ oe or 10.02 M1 $2.5 \div 0.75$ <b>and</b> " $10.02$ " $\div 3.15$ C1 for both 3.3(3.. and 3.1(8...)) and correct conclusion  OR any equivalent process using correct methods which leads to two values that can be compared

5MB3F_01				
Question	Working	Answer	Mark	Notes
18	$x + x + 4 + x - 2 = 26$ $3x + 2 = 26$ $3x = 24$ $x = 8$  OR $26 - 4 = 22$ $22 + 2 = 24$ $24 \div 3$	8	4	M1 $x + x + 4$ or $x + x - 2$ or $x + 4 + x - 2$ or "expression in $x$ " + $x + 4 = 26$ or "expression in $x$ " + $x - 2 = 26$ M1(dep) " $3x + 2$ " = 26 M1 " $3x = 26 - 2$ " A1 cao OR M1 $26 - 4$ or $26 + 2$ M1 " $22$ " + 2 or " $28$ " - 4 M1 " $24$ " $\div$ 3 A1 cao OR M3 $6 + 8 + 12$ seen (M2 three ages that meet the criteria $x$ , $x + 4$ and $x - 2$ ) (M1 two trials of three ages added or a set of three ages that would add to 26 ) A1 cao
19	$\pi \times 20$	62.8 cm	3	M1 $\pi \times 20$ or $\pi \times 19.5$ or $\pi \times 19.95$ A1 62.8 – 63 B1(indep) for units consistent with answer

5MB3F_01					
Question		Working	Answer	Mark	Notes
20	(a)		-1, 0, 1, 2, 3	2	B2 cao (B1 four correct values and none incorrect or -2, -1, 0, 1, 2, 3)
	(b)	$3x > 11$ $x > \frac{11}{3}$ or 3.66.. OR $(16 - 5) \div 3$ $\frac{11}{3}$ or 3.66..	4	3	M1 $3x > 11$ or $3x > 16 - 5$ or $3x + 5 - 5 > 16 - 5$ A1 $\frac{11}{3}$ or 3.6(66..) or 3.7 (Accept = or $\geq$ in place of >) B1 ft OR M1 $(16 - 5) \div 3$ A1 $\frac{11}{3}$ or 3.6(66..) or 3.7 B1 ft
21		$9^2 + 14^2 = 81 + 196 =$ 277 $AB = \sqrt{277}$	16.6	3	M1 $9^2 + 14^2$ or $81 + 196$ or 277 M1 $\sqrt{277}$ or $\sqrt{81 + 196}$ or A1 16.6 -16.643





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