General Certificate of Secondary Education

March 2012

Mathematics   **43602F**

Foundation

Unit 2

Final

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

UMS conversion calculator www.aqa.org.uk/umsconversion

The following abbreviations are used on the mark scheme:

M   Method marks awarded for a correct method.

M dep   A method mark which is dependent on a previous method mark being
               awarded.

A   Accuracy marks awarded when following on from a correct method.
               It is not necessary always to see the method. This can be implied.

B   Marks awarded independent of method.

Q   Marks awarded for quality of written communication.

ft   Follow through marks. Marks awarded for correct working following a
               mistake in an earlier step.

SC   Special Case. Marks awarded for a common misinterpretation which has
               some mathematical worth.

oe   Or equivalent.

[a, b]   Accept values between a and b inclusive.

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1a	(2, 5)	B1	
1b	*B* plotted at (8, 1)	B1	
1c	(5, 3)	B2 ft	ft from their *B* B1 ft for 1 number correct or point shown on grid

2a	21 and 35	B2	B1 for 1 correct (and 1 incorrect) or 2 correct and 1 incorrect
2b	6 and 10	B2	B1 for 1 correct (and 1 incorrect) or 2 correct and 1 incorrect
2c	16 and 25	B2	B1 for 1 correct (and 1 incorrect) or 2 correct and 1 incorrect

3	198	B2	B1 for attempt at correct method of subtraction or adding on eg 8 in units column or sight of decomposition 77 + 21 (+100)

4	2×9.25 (= 18.5(0)) or $2 \times 5.5(0)$ (= 11.(00))	M1	
	29.5(0)	A1	
	4.5(0)	B1 ft	ft from their 29.5(0) – 25
	Complete method shown	Q1	Strand (iii) For finding cost of 2 adult tickets + 2 child tickets and subtracting 25

5	85 and 115	B2	Either order B1 for 2 numbers adding to 200 B1 for 2 numbers with a difference of 30 B1 for 1 correct

6a	Add 6 or +6 or plus 6	B1	oe
6b	38 and 44	B1 ft	ft from their rule
6c	$302 - 2 \times 6$ or $302 - 6 - 6$	M1	oe eg use $6n + 2$ Evidence of subtracting 6 from 302 from $302 - 6$ (–6)
	290	A1 ft	ft from their rule

7	3×27 or 81(p) or (£)0.81	M1	
	their (£)0.81 + 5.99 + 1.80 (= 8.6(0))	M1	Allow mixed units eg 81(p) + (£)5.99 + (£)1.80
	10 – their 8.6(0)	M1	
	1.40	Q1	Strand (i) Correct notation Do not accept 1.4

8a	7.5 Not equivalent to $\frac{3}{4}$ or 0.75 or 75%	B1	oe or other valid reason
8b	$\frac{4}{10}$ and Not equivalent to $\frac{1}{3}$	B1	oe or other valid reason
8c	$\sqrt{125}$ Not an exact square root	B1	oe or other valid reason
8d	15 Not a prime number or other valid reason	B1	eg only multiple of 3 or only multiple of 5

9	eg $4 \times \frac{1}{4}(l) = 1(l)$	M1	oe $20 \div 4$ or 5 or $\frac{1}{5}$
	4×4 or 16	M1	oe their $5 \times \frac{1}{4}$
	No and 16	A1	oe eg No and $1\frac{1}{4}$

10	–7 and 2 = –5 and –5 and 0 = –5 and –3 and –2 = –5	B2	Either order for each pair B1 for 2 pairs with a total of –5 B1 for 2 pairs with same correct total eg –5 and 2 = –3 –3 and 0 = –3 **or** –7 and 0 = –7 –5 and –2 = –7 B1 for 3 correct pairs with incorrect totals

11a	24	B1	
11b	$7c + 3d$ or $3d + 7c$	B2	B1 for $7c$ or $3d$ Do not ignore further working
11c	3×4 and 5×-2 or 12 and -10	M1	oe
	2	A1	

12	$3 \div 8$ or $\frac{3}{8} \times 100$ or $\frac{38}{100}$ or 38(%) or 37.(5%)	M1	
	0.37(5) or $\frac{76}{200}$ and $\frac{75}{200}$ or 37.(5%) and 38(%)	A1	oe
	Both numbers in same format and correct conclusion from their values	Q1	Strand (ii) Dependent on M1 and correct method(s) for conversion(s) SC1 for $\left(\frac{1}{8} = \right)$ 0.125 or 12.5%

13a	10^5	B1	
13b	20	B3	B2 for 8 and 25 seen B1 for 8 or 25 seen

14	$\frac{1}{3}$ or $\frac{3}{4}$ or $1 - \frac{2}{3}$ or $1 - \frac{1}{4}$ seen	M1	oe
	$18 = \frac{3}{4}$ or $\frac{1}{4} = 6$ or $\frac{1}{3} = 6$ or $\frac{1}{2}$ or $6 \times 3 (= 18)$ or $\frac{2}{3} \times \frac{3}{4}$ seen	M1 dep	
	6×4 or $\frac{\text{their } 18}{3} \times 4$ or $18 + 6$	M1 dep	Calculation leading to a final answer of 24
	24	A1	SC1 for $\frac{11}{12}$ SC2 for 72 (£)6 = $\frac{2}{3}$ → (£)9 then $\frac{9 \times 4}{3}$ = 12 is SC3

15a	$C = 10d + 20$	B1	
15b	Plots at least two correct points ($\pm\frac{1}{2}$ sq)	M1	
	Correct line from (0, 30) at least to intersection at (5, 70)	A1	
15c	First Cars	B1 ft	Strict ft
	Cheaper (check graph) Graph lower down Roys Rentals = 90 and First Cars = 86	B1 ft	oe

16a	$12 - x = 15$ or $12 - x = 5 \times 3$	M1	oe $4 - \frac{x}{3} = 5$
	$-x =$ their $15 - 12$ or $x = 12 -$ their 15	M1	or $4 - 5 = \frac{x}{3}$ $-1 = \frac{x}{3}$ or $5 - 4 = \frac{-x}{3}$
	-3	A1	
16b	$3t = s - 4$ or $\frac{s}{3} = t + \frac{4}{3}$	M1	oe
	$(t =) \frac{s-4}{3}$ or $(t =)\frac{s}{3} - \frac{4}{3}$ or $(t =) \frac{4-s}{-3}$	A1	oe SC1 $(t =) \frac{4-s}{3}$ or $(t =) \frac{s+4}{3}$

17	100×0.84 or $60 \times 1.1(0)$	M1	84 or 66 or 150	Money out
	their 150×1.4 (= 210)	M1 dep	oe dep on first M1	Required total sales income
	$100 \times 1.2(0)$ or $40 \times 1.6(0)$	M1	120 or 64 or 184	Money in after 40 packs sold
	(their 210 – their 184) ÷ 20	M1 dep	dep on 2nd and 3rd M1	Money needed ÷20
	1.30	A1	Do not accept 1.3	
Alternative method 1				
	100×0.84 or $60 \times 1.1(0)$	M1	84 or 66 or 150	Money out
	$100 \times 1.2(0)$ or $40 \times 1.6(0)$	M1	120 or 64 or 184	Money in after 40 packs sold
	their 184 – their 150	M1 dep	34 if correct dep on 1st and 2nd M1	Profit after 40 packs sold
	($0.4 \times$ their 150 – their 34) ÷ 20	M1 dep	dep on 3rd M1	Money needed ÷20
	1.30	A1	Do not accept 1.3	
Alternative method 2				
	100×0.84 or $60 \times 1.1(0)$	M1	84 or 66 or 150	Money out
	100×0.36 or 40×0.50	M1	36 or 20 or 56	Profit so far
	($0.4 \times$ their 150 – their 56) ÷ 20	M1 dep	0.20 if correct dep on 1st and 2nd M1	Profit per pack needed
	their 0.20 + 1.10	M1 dep	dep on 3rd M1	Cost price + profit per pack
	1.30	A1	Do not accept 1.3	
Alternative method 3				
	$100 \times 1.2(0)$ or 100×0.84	M1	120 or 84 or 36	Profit
	$40 \times 1.6(0)$ or $60 \times 1.1(0)$	M1	64 or 66 or –2	Profit
	their 36 + their (–2)	M1 dep	34 if correct dep on 1st and 2nd M1	Profit after 40 packs sold
	($0.4 \times$ their 150 – their 34) ÷ 20	M1 dep	dep on 3rd M1	Money needed ÷20
	1.30	A1	Do not accept 1.3	