



**General Certificate of Secondary Education**

**Mathematics 4307**

*Specification B*

**Module 3 Tier F 43053F**

**Final**

**Mark Scheme**

*2010 examination - June series*

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 meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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**The following abbreviations are used on the mark scheme:**

<b>M</b>	Method marks awarded for a correct method.
<b>A</b>	Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.
<b>B</b>	Marks awarded independent of method.
<b>E</b>	Marks awarded for an explanation.
<b>M dep</b>	A method mark which is dependent on a previous method mark being awarded.
<b>ft</b>	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
<b>SC</b>	Special Case. Marks awarded for a common misinterpretation which has some mathematical worth.
<b>oe</b>	Or equivalent.

**MODULE 3 FOUNDATION TIER**

**43053F**

1(a)	$89 \times 20$ or $89 \times 0.2(0)$ or 1780	M1	oe
	17.80(p)	A1	17.8 M1 A0
1(b)	$1 \times 79 (+) 2 \times 213 (+) 5 \times 64 (+)$ $10 \times 176$	M1	If only answers for their products seen, three must be correct
	$(0.)79 + 4.26 + 3.2(0) + 17.6(0) +$ their 17.8(0)	A1	Ignore any total calculated

2(a)	0.076, 0.3, 5, 34.8	B2	B1 full but incorrect list with 0.076 written first or B1 one omission or B1 full list in reverse order
2(b)(i)	Valid explanation eg $9 \times 4$	B1	Any valid reference to end digits
2(b)(ii)	88 146	B1	

3(a)	Any 4 small squares shaded	B1	oe Allow if intention is clear
3(b)	Any 6 small squares shaded	B1	oe Allow if intention is clear
3(c)	$\frac{3}{8}$ is larger as more squares are shaded	B1 ft	Accept other reasons such as conversions to common notation eg $25\% = \frac{2}{8}$ or $\frac{1}{4}$ or $\frac{3}{8} = 37.5\%$ or 0.375 Only ft from counting squares

4(a)	$480 \times 0.15$	M1	oe eg build-up $48 + 24$
	72	A1	SC1 408 with 72 not seen
4(b)	85	B1	
4(c)	408	B1 ft	ft from part (a) <b>or</b> part (b) $480 - \text{their } 72$ or $480 \times \text{their } 0.85$

5(a)(i)	$24 \times (0.)85$	M1	$23 \times (0.)85$
	20.4(0)	A1	(£)19.55 and only 45(p) left oe
	<b>Alternative method</b>		
	$2000 \div 85$ or $20 \div 0.85$	M1	
	23.(...)	A1	
5(a)(ii)	40	B1	Allow £0.40 Do not allow £0.4 or 0.40
5(b)	(18 plants and pots cost) $18 \times 0.85 + 3 \times 1 (= 18.3(0))$	M2	M1 for (6 plants and pots cost) $6 \times 0.85 + 1 (= 6.1(0))$ or (12 plants and pots cost) $12 \times 0.85 + 2 \times 1 (= 12.2(0))$
	18	A1	SC1 Answer 17 or 19
	<b>Alternative method</b>		
	(6 plants and pots cost) $6 \times 0.85 + 1 (= 6.1(0))$	M1	
	$20 \div$ their 6.10 (= 3.2...) their 3.2 truncated to nearest integer $\times 6$	M1 dep	
	18	A1	

6(a)	$4 (+) 2 (\times) 20$	M1	At least 2 values correct
	44	A1	SC1 44 or 120 no working shown
6(b)	44.9846	B1	Full display must be seen

7(a)	$948 \div 6$	M1	
	158	A1	158 : 948 M1 A0
7(b)	1 : 12	B2	B1 their $\frac{158}{2} : 948$ B1 1 : 12 not in simplest form eg $\frac{1}{2} : 6$

8	$\frac{100}{7}$	M1	oe
	14.2 to 14.3 inclusive	A1	$14\frac{2}{7}$
	their 14.2.../0.44	M1 dep	
	32 to 33 inclusive <b>and</b> yes	A1 ft	oe to saying 'yes'
	<b>Alternative method 1</b>		
	$30 \times 0.44$	M1	
	13.2	A1	
	$\frac{100}{7}$	M1	oe
	14 to 14.3 inclusive <b>and</b> yes	A1 ft	oe to saying 'yes'
	<b>Alternative method 2</b>		
	$30 \times 0.44$	M1	
	13.2	A1	
	their $13.2 \times 7$	M1 dep	
	92.4 <b>and</b> yes	A1 ft	oe to saying 'yes'

9	50 (×) 2 or 25 (×) 2 (×) 2 or 10 (×) 5 (×) 2 or 5 (×) 5 (×) 4 or 5 (×) 20	M1	Allow on factor trees or repeated division Condone use of × 1
	2 (×) 2 (×) 5 (×) 5	A1	
	$2^2 \times 5^2$	A1 ft	Allow dots for × but no other alternatives ft only with prime factors and after M1 awarded

10(a)	Thirty thousand eight hundred (and) ten	B1	Ignore spelling if intention clear
10(b) (i)	$2\frac{3}{4}$	B1	
10(b) (ii)	2.75	B1	

11(a)	525	B1	
11(b)	18	B1	

12(a)	$1.08 - 0.9(0)$	M1	$108 - 90$ or $1.08 - 90$
	18	A1	£0.18
12(b)	$8.22 + 2.8(0)$ (= 11.02)	M1	
	their $11.02 + 2.8(0)$	M1 dep	
	(circles) 7 kg	A1	To award 3 marks with 7 kg circled you must see at least enough for M1
	<b>Alternative method</b>		
	$13.82 - 8.22$ (= 5.6(0))	M1	
	their $5.6(0) \div 2.8(0)$ (= 2)	M1 dep	
	(circles) 7 kg	A1	To award 3 marks with 7 kg circled you must see at least enough for M1

13(a)	15 (+) 30 (=) 45 or 15 (+) 45 (=) 60	B2	B1 correct total for any two different numbers from the list B1 any two different numbers correctly making a total from the list
13(b)	4 (+) 9 (=) 13 or 9 (+) 9 (=) 18 or 9 (+) 36 (=) 45	B2	B1 <b>identification</b> of at least 2 different square numbers

14(a)	Decimal points and digits clearly lined up in columns (no + sign needed)	M1	Place value for digits must be correct									
	25.07	A1	SC1 2507									
14(b)	342 (and) 1520 or 392 (and) 1470	M1	Two values seen, one must be correct, and one must have final digit zero									
	342 + 1520 or 392 + 1470	M1 dep	Adds their two values (must obtain a total)									
	1862	A1										
	18.62	B1 ft	their integer correctly divided by 100									
	<b>Alternative method 1</b>											
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">30</td> <td style="text-align: center;">8</td> </tr> <tr> <td style="text-align: center;">40</td> <td style="text-align: center;">1200</td> <td style="text-align: center;">320</td> </tr> <tr> <td style="text-align: center;">9</td> <td style="text-align: center;">270</td> <td style="text-align: center;">72</td> </tr> </table>		30	8	40	1200	320	9	270	72	M1	At least 2 values correct from 1200, 320, 270 and 72
	30	8										
40	1200	320										
9	270	72										
	their 1200 + their 320 + their 270 + their 72	M1 dep	Adds their four values (must obtain a total)									
	1862	A1										
	18.62	B1 ft	their integer correctly divided by 100									
	<b>Alternative method 2</b>											
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">0.8</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">12</td> <td style="text-align: center;">3.2</td> </tr> <tr> <td style="text-align: center;">0.9</td> <td style="text-align: center;">2.7</td> <td style="text-align: center;">0.72</td> </tr> </table>		3	0.8	4	12	3.2	0.9	2.7	0.72	M1	At least 2 values correct from 12, 3.2, 2.7 and 0.72
	3	0.8										
4	12	3.2										
0.9	2.7	0.72										
	their 12 + their 3.2 + their 2.7 + their 0.72	M1 dep	Adds their four values (must obtain a total)									
	18.62	A2	A1 cannot be scored									

**14(b) continued on next page**



<b>14(b) Cont</b>	<b>Alternative method 3</b>																		
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;"><b>3</b></td> <td style="text-align: center;"><b>8</b></td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">7</td> <td style="text-align: center;">2</td> <td style="text-align: center;">9</td> </tr> <tr> <td></td> <td style="text-align: center;">7</td> <td style="text-align: center;">2</td> <td></td> </tr> </table>		<b>3</b>	<b>8</b>		1	2	3	4	2	7	2	9		7	2		M1	At least 2 values correct from 1/2, 3/2, 2/7 and 7/2
		<b>3</b>	<b>8</b>																
	1	2	3	4															
2	7	2	9																
	7	2																	
Adds their diagonals eg																			
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;"><b>3</b></td> <td style="text-align: center;"><b>8</b></td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">8</td> <td style="text-align: center;">2</td> <td style="text-align: center;">7</td> <td style="text-align: center;">9</td> </tr> <tr> <td></td> <td style="text-align: center;">6</td> <td style="text-align: center;">2</td> <td></td> </tr> </table>		<b>3</b>	<b>8</b>		1	1	3	4	8	2	7	9		6	2		M1 dep	Must obtain 4 diagonal totals	
	<b>3</b>	<b>8</b>																	
1	1	3	4																
8	2	7	9																
	6	2																	
1862	A1	Must be seen as a number not just around the edges of the diagram																	
18.62	B1 ft	their integer correctly divided by 100																	

15	(28 =) 40%	B1	oe eg 14 → 20% or 42 → 60%
	$\frac{28}{40} \times 100 (= 70)$	M1	oe 42 + 28
	their 70 × 2	M1 dep	
	140	A1	

16(a)	-12	B1	
16(b) (i)	-487	B1	
16(b) (ii)	-24 350	B2	B1 a negative number with the digits 2435 in right order B1 24350

17(a)	Appropriate common denominator with at least one correct numerator	M1	$\frac{6}{15}$ (-) $\frac{5}{15}$ oe
	$\frac{1}{15}$	A1	oe
17(b)	$\frac{7}{4} \times \frac{7}{5}$ or $1\frac{3}{4} \times \frac{7}{5}$	M1	oe
	$\frac{49}{20}$	A1	oe eg $2\frac{9}{20}$

18	$450 - 400 (= 50)$	M1	$\frac{450}{400} - 1 (= 0.125)$ or $\frac{450}{400} \times 100 (= 112.5)$
	$\frac{\text{their } 50}{400} \times 100$	M1 dep	oe eg $\frac{50}{4}$ their $0.125 \times 100$ or their $112.5 - 100$
	12.5	A1	SC1 sight of or answer of $\frac{1}{8}$