



**General Certificate Secondary of Education
June 2012**

Applications of Mathematics (Pilot) 9370

Unit 2 Foundation Tier 93702F

Mark Scheme

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Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

- M** Method marks are awarded for a correct method which could lead to a correct answer.
- A** Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
- B** Marks awarded independent of method.
- Q** Marks awarded for quality of written communication. (QWC)
- M Dep** A method mark dependent on a previous method mark being awarded.
- B Dep** A mark that can only be awarded if a previous independent mark has been awarded.
- ft** Follow through marks. Marks awarded following a mistake in an earlier step.
- SC** Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
- oe** Or equivalent. Accept answers that are equivalent.
eg, accept 0.5 as well as $\frac{1}{2}$

A2 Foundation Tier

Q	Answer	Mark	Comments
1(a)	D	B1	
1(b)	C	B1	
1(c)	B	B1	
2(a)	6	B2	B1 4 (h) or 2 (h) or their 4 + their 2
2(b)	their 4 + 4 + 4 + 2 + 2 + 2 + 2 + 2 or their 6 + 2 + 6 + 6 + 2	M1	oe eg 3 × their 4 + 5 × their 2 18 + 4 Allow one error or omission eg 4 + 4 + 4 + 2 + 2 + 2 + 2 3 × 6 + 3 × 2 ft Their 4 and/or their 2 and/or their 6
	22	A1 ft	
2(c)	Their 22 × 8.75	M1	
	192.50	A1 ft	
	190	B1 ft	ft Their 192.50 rounded to the nearest 10
3(a)(i)	50	B1	
3(a)(ii)	70 – their 50	M1	oe eg 50 + 20
	20	A1 ft	ft Their (a)(i)
3(b)(i)	$\frac{1}{4}$ or 0.25	B1	
3(b)(ii)	250	B1	
3(c)	2.4	B1	
	3.9(0) ÷ their 2.4	M1	1.5(0) × their 2.4 3.9(0) ÷ 1.5 oe
	1.6(25) or 1.63 and No	A1 ft	3.6(0) and No 2.6 and their 2.4 and No

Q	Answer	Mark	Comments
4(a)	250	B1	
4(b)	$100 \times 2 (-150)$	M1	or 200
	50	A1	
4(c)	$36 \div 4 (=9)$	B1	oe eg 4×9
	Their $9 \times 2 (\div 3)$	M1	or their $9 \div 3 (\times 2)$
	6	A1	
Alt 4(c)	2 : 1 6 : 3	B1	Obtains ratio equivalent to 4 people : 2 litres
	$36 \div 2 (\div 3)$ $36 \div 6$	M1	Number of people \div number of people
	6	A1	

5	<p>Coins that fit all conditions Sue must have 10 p or 20 p or £1</p> <p>If Sue has 10p, Pete has £1 50p 10p or £1 £1 10p</p> <p>If Sue has 20p, Pete has £1 £1 not 20p, £1 or £2 or £1 50p not 20p or £2 or 50p 50p 50p</p> <p>If Sue has £1, Pete has £2 20p not 50p, £1 or £2 or £2 10p 10p</p>	B3	<p>B2 Coins that fit all conditions apart from Pete having between £1.20 and £2.50</p> <p>eg 1 Pete £2 £1 50p Sue 20p eg 2 Pete 50p 20p 2p Sue 50p eg 3 Pete £1 10p 5p Sue 10p eg 4 Pete 10p 10p 5p Sue £1</p> <p>B1 Pete has three coins worth between £1.20 and £2.50</p> <p>eg 1 Pete £1 £1 50p eg 2 Pete £2 10p 5p eg 3 Pete £1 £1 2p eg 4 Pete £2 10p 1p or Pete has three coins that total £1.20 eg 5 Pete £1 10p 10p eg 6 Pete 50p 50p 20p</p>
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6(a)(i)	S(outh)	B1	
6(a)(ii)	E(ast)	B1	
6(b)	$034^\circ (\pm 2^\circ)$	Q1	Strand (i) Do not allow $34^\circ (\pm 2^\circ)$
6(c)	(4, 3)	B1	
6(d)	$12 \div 3 (\times 5) (=4)$	M1	or $12 + 8$
	20	A1	

Q	Answer	Mark	Comments
7(a)	100	B1	
7(b)	20	B1 ft	Correct answer or ft ft Their $100 \div 5$
7(c)	3	B1	
7(d)	Identifies Ben and gives a full and correct explanation eg 1 After 4 months Ben always has a bigger total saved eg 2 It takes Ben 10 (or 4) months and Alice 12 (or 6) months eg 3 After 10 months Alice only has £170 eg 4 Ben's graph is steeper and he has more savings after 5 months	B2	B1 Identifies Ben and gives a partial explanation, eg the graph is steeper Ben saves (£5) more each month or B1 Attempt to work out how many months it takes to save £200 for either Ben or Alice, eg $200 \div 20$ $\frac{200 - 20}{15}$

8	Works out at least 4 correct multiples of 10 eg 20 30 40 50 60	M1	or States that there are 10 multiples oe eg states there are 10 prizes
	Works out at least 4 correct factors of 100 eg 1 2 5 20	M1	or States that there are 9 factors oe eg states there are 9 prizes
	10 20 30 40 50 60 70 80 90 100 and 1 2 4 5 10 20 25 50 100	A1	Must identify multiples and factors. Can be implied by "Rob" and "Kim"
	Rob	B1 ft	ft From their numbers of multiples and their number of factors or their numbers of prizes

Q	Answer	Mark	Comments
9	12 (inches) → 30 (cm)	B1	oe eg 6 (inches) → 15 (cm)
	30×5 (= 150)	M1	15×10 (= 150)
	Their 150 + 15	M1	
	165 and Tina	A1	oe eg Tina is 5 cm taller
	Obtains a conversion and uses it to change either given height to the other unit; compares their converted height with the other given height and makes a conclusion	Q1	Strand (iii)
Alt 1 9	20 (cm) → 8 (inches)	B1	oe eg 10 (cm) → 4 (inches)
	$8 \times (160 \div 20)$ (= 64)	M1	$4 \times (160 \div 10)$ (= 64)
	Their 64 ÷ 12	M1	
	5 ft 4 in and Tina	A1	oe eg 5.33... and 5.5 and Tina
	Obtains a conversion and uses it to change either given height to the other unit; compares their converted height with the other given height and makes a conclusion	Q1	Strand (iii)
Alt 2 9	6 (inches) → 15 (cm)	B1	
	$5 \times 12 + 6$ (= 66)	M1	oe
	Their 15 × their (66 ÷ 6)	M1	
	165 and Tina	A1	
	Obtains a conversion and uses it to change either given height to the other unit; compares their converted height with the other given height and makes a conclusion	Q1	Strand (iii)
Alt 3 9	1 (inch) → 2.5 (cm)	B1	
	$160 \div 2.5$ (= 64)	M1	
	$5 \times 12 + 6$ (= 66)	M1	
	64 and 66 and Tina	A1	oe eg, Tina is 2 inches taller
	Obtains a conversion and uses it to change either given height to the other unit; compares their converted height with the other given height and makes a conclusion	Q1	

Q	Answer	Mark	Comments
10(a)(i)	$180 - 72$	M1	oe eg $? + 72 = 180$ $108 + 72 = 180$
	108	A1	
10(a)(ii)	$360 - (100 + 75 + 60)$	M1	oe eg $? + 100 + 75 + 60 = 360$
	125	A1	
10(b)	$420 \div 6$	M1	oe eg $6x = 420$ or 6 (edges) $\rightarrow 420$
	70	A1	
	(2 \times) their 70 \times their 70	M1	Must be (2 \times) $x \times x$
	9800	A1 ft	ft 2 \times their 70 \times their 70 SC3 Answer digits 98 SC2 Answer digits 49
11(a)	$875 + 2 \times 50$	M1	$87.5 + 2 \times 5$
	975	A1	97.5 and 104 Must see 104 if using right hand scheme
11(b)(i)	Yes and length (80) or width (50) is less than tube length (87.5)	B1	oe Can use length or width
11(b)(ii)	No and 50 (and/or 80) is more than tube length (48)	B1	oe Must use 50
11(c)	$3 \times 7.6 + 4 \times 0.5$ (= 24.8) or $3 \times 7.6 + 3 \times 0.5$ (= 24.3) or $3 \times 7.6 + 2 \times 0.5$ (= 23.5)	M1	$22.8 + 2$ or $22.8 + 1.5$ or $22.8 + 1$
	$7.6 + 2 \times 0.5$ (= 8.6)	M1	
	Their 24.8 \times their 8.6 \times 50	M1	Their length \times their width \times 50
	10664	A1 ft	ft From M1 M0 M1 or M0 M1 M1 only

Q	Answer	Mark	Comments
12(a)	32	B1	
12(b)	30	B1	
12(c)	Q and 8	B2	B1 24 or 16 or 8 seen or 32 and 48 seen or Q with reason why it is faster eg Q as the line is steeper SC1 Q and $\frac{2}{15}$ (or $0.1\dot{3}$)
13(a)	Arc drawn inside rectangle, centre X, radius [3.8 cm, 4.2 cm]	B2	B1 Arc drawn inside rectangle, centre X, radius outside allowed range or At least 4 points marked within the allowed tolerance or Arc with at least half within the tolerance
13(b)	Correct (shortest) measurement (± 2 mm) taken from Y to their arc drawn in (a) [8 cm, 8.4 cm] if (a) correct	M1	
	[16, 16.8]	A1 ft	ft Their [8, 8.4] $\times 2$ SC1 Arc drawn, centre Y, that touches (± 2 mm) their arc drawn in (a)
Alt 1 13(b)	Measures length and width correctly (± 2 mm) and uses Pythagoras and subtracts 4 ie $\sqrt{[9.8, 10.2]^2 + [6.8, 7.2]^2} - 4$ (= [7.9, 8.5])	M1	Measures length and width correctly (± 2 mm), applies scale, uses Pythagoras and subtracts 8 ie $\sqrt{[19.6, 20.4]^2 + [13.6, 14.4]^2} - 8$
	[15.8, 17]	A1	Do not ft for this method
Alt 2 13(b)	Measures XY correctly (± 2 mm) and subtracts 4 ie [12, 12.4] – 4 (= [8, 8.4])	M1	Measures XY correctly (± 2 mm), applies scale and subtracts 8 ie [24, 24.8] – 8
	[16, 16.8]	A1	Do not ft for this method

Q	Answer	Mark	Comments
14(a)(i)	0.72	B1	
14(a)(ii)	$2.8 \times 1.9 - \text{their } 0.72$	M1	oe eg $280 \times 190 - \text{their } 7200$ $5.32 - \text{their } 0.72$
	4.6(0)	A1 ft	ft From their (a)(i) and consistent units Allow M1 A1 ft for 46000 if their (a)(i) is 7200 SC1 Answer with digits 46
14(b)	$2.4 \times 1.9 + \frac{1}{2} \times 2.4 \times (2.2 - 1.9)$ (= 4.92) or $2 \times \frac{1}{2} \times 1.2 \times (1.9 + 2.2)$ (= 4.92) or $2.4 \times 2.2 - \frac{1}{2} \times 2.4 \times (2.2 - 1.9)$	B2	oe B1 $\frac{1}{2} \times 2.4 \times (2.2 - 1.9)$ or $\frac{1}{2} \times 1.2 \times (1.9 + 2.2)$ oe or 4.56 + 0.36 (no working) or 5.28 – 0.36 (no working)
14(c)	$2 \times \text{their } 4.6$ (= 9.2) or 2×4.92 (= 9.84) or (their 4.6 + 4.92) ($\times 2$) (= 9.52 or 19.04)	M1	
	Their 19.04×2 (= 38.08)	M1	Their $19.04 \div 5$ (= 3.808)
	Their $38.08 \div 5$	M1	Their 3.808×2
	[7.6, 7.62]	A1 ft	Only ft from their 4.6(0) Accept 8 with correct working seen
Alt 14(c)	(2 \times) 4.92 sections need (2 \times) 1 litre or (2 \times) 4.6 sections need (2 \times) 1 litre	M1	
	(2 \times) 4.92 sections need (2 \times) 1 litre and (2 \times) 4.6 sections need (2 \times) 1 litre	M1	
	$(2 + 2) \times 2$	M1	oe eg 4×2
	8	A1	