



**General Certificate Secondary of Education
January 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)	1.75 metres	B1	Any unambiguous indication eg, 1.75 metres underlined or ticked
1(b)	2 litres	B1	Any unambiguous indication eg, 2 litres underlined or ticked
1(c)	30 grams	B1	Any unambiguous indication eg, 30 grams underlined or ticked
2	1p 1p 1p 2p	M1	M3 Identifies these 14 coins 1p 1p 1p 2p 5p 5p 5p 5p 10p 10p 10p 10p 50p 50p
	5p 5p 5p 5p 10p 10p 10p 10p	M1	M2 Identifies any combination of 13 coins with total £1.65, eg, 1p 2p 2p 5p 5p 5p 5p 10p 10p 10p 10p 50p 50p
	50p 50p	M1	M1 Identifies any combination of coins with total £1.65, eg, 1p 2p 2p 5p 5p 10p 10p 10p 10p 10p £1
	£1, £1, 20p, 20p, 2p, 1p	A1	SC3 Identifies any combination of 7 coins with total £2.43, eg, £1, £1, 20p, 20p, 1p, 1p, 1p SC2 Identifies any combination of coins with total £2.43, eg, £1, 50p, 50p, 20p, 20p, 1p, 1p, 1p
Alt 2	$£1 + £1 + 50p + 50p + 20p + 20p + 10p + 10p + 10p + 10p + 5p + 5p + 5p + 5p + 2p + 2p + 1p + 1p + 1p + 1p$ (or (£)4.08 or 408(p))	M1	oe eg, addition of rows Allow one error, addition or omission
	Their 4.08 – 1.65 or their 408 – 165	M1	
	Their 2.43 or their 243	M1	
	£1, £1, 20p, 20p, 2p, 1p	A1	SC3 £2.43 seen

Q	Answer	Mark	Comments
3(a)	All O's and X's in correct positions	B2	B1 One O or X in correct position
3(b)	Fully correct explanation eg, Amir can put an O either in B2 or A2 (and Mel can only put an X in one of these)	B2	oe B1 Partially correct explanation eg, Amir has two possible winning positions oe or Gives one winning position in form A2 or B2
4(a)	Parallelogram	B1	Condone incorrect spelling if intention clear
4(b)	Isosceles	B1	Any unambiguous indication eg, isosceles underlined or ticked
4(c)(i)	4	B1	
4(c)(ii)	<i>B</i> and/or <i>E</i>	B1	oe, eg, parallelogram and/or rectangle B0 Any incorrect shapes also given
4(c)(iii)	<i>C</i> and <i>D</i>	B2	oe, eg, trapezium and triangle B1 Only <i>C</i> or only <i>D</i> or <i>C</i> and <i>D</i> and one incorrect letter B0 Two incorrect values given or <i>C</i> or <i>D</i> and one incorrect letter

Q	Answer	Mark	Comments
5(a)(i)	94	B1	
5(a)(ii)	18	B2	B1 $1\frac{1}{2}$ or 1.5 or 1 y(ear) 6 m(onths) or (1.5, 82) identified on graph SC1 20 or 21 months
5(b)(i)	160 + 181	M1	or 1.6 + 1.81
	341	A1	or 3.41
	Their 341 + 13 or their 341 – 13	M1	or their 3.41 + 0.13 or their 3.41 – 0.13
	(Tim) 177 and (Mary) 164	A1ft	Condone 1.77(m) and 1.64(m) ft Their 341 or 3.41
5(b)(ii)	<p>Gives a correct conclusion based on their 167 and their 174 justified by correct numerical evidence using a valid strategy to show that their heights could overlap (or be closer)</p> <p>Examples</p> <p>Yes Tim could be 167 (174 – 7) (cm) and Mary could be 174 (167 + 7) (cm)</p> <p>Yes Tim could be 169 (174 – 5) (cm) and Mary could be 172 (167 + 5) (cm)</p> <p>No The shortest Tim could be is 164 (174 – 10) (cm) and the tallest Mary could be is 157 (147 + 10) (cm) (ft Tim 174, Mary 147)</p>	B2ft	<p>B1ft Gives correct numerical evidence, based on their 167 and their 174, using a valid strategy to show that their heights could overlap (or be closer) but gives no conclusion (or incorrect conclusion)</p> <p>Example Tim could be 169 (cm) and Mary could be 170 (cm)</p> <p>or</p> <p>Gives a correct conclusion based on their 167 or their 174 with only partial numerical evidence</p> <p>Example Yes. Mary could be 177 (cm)</p> <p>or</p> <p>Gives a conclusion, based on their 167 and their 174, corresponding to an invalid strategy</p> <p>Example No. Tim could be 174 – 10 and Mary could be 167 – 10</p> <p>or</p> <p>Gives a correct conclusion based on their 167 and their 174 justified by numerical evidence but with the stated interpretation of 'within 10' as ± 5</p>

Q	Answer	Mark	Comments
6	25% → 1 : 4 5% → 1 : 20 20% → 1 : 5 12.5% → 1 : 8	B3	B2 2 or 3 correct B1 1 correct
7(a)	14	B1	
7(b)	7 or 9	B1	
	Their 7 + their 9 + their 14 (= 30)	M1	Their 7 × 20 or their 9 × 20 or their 14 × 20
	Their 30 × 20 (÷ 100)	M1	Their 7 × 20 + their 9 × 20 + their 14 × 20
	6(.00)	A1	M3 A0 600(p)
7(c)	Four more letter l's correctly drawn (with answer 9)	B3	B2 Two or three more letter l's correctly drawn B1 One more letter l correctly drawn

Q	Answer	Mark	Comments
8(a)	$78 + 36 + 78 + 36$	M1	oe
	228	A1	
8(b)	All lengths identified $27 \times 2 (+) 78 \times 2 (+) 21 \times 2 (+) 36$	M3	Allow one missing or one extra length or double length oe eg, $27 \times 2 (+) 21 \times 6 (+) 18 \times 4 (+) 36$ M2 Identifies five or more lengths, three of which are different and correct, eg, $27 \times 2 (+) 21 \times 2 (+) 39 \times 4$ M1 Identifies three or more lengths, two of which are different and correct eg, $21 (+) 21 (+) 21 (+) 21 (+) 36$
	$54 + 156 + 42 + 36$	A1	oe
8(c)	Their $288 +$ their $228 (= 516)$	M1	
	Their $516 \div 80 (= 6.45)$	M1	
	Their $6.45 \div 5$ rounded up (or 2)	M1	
	59.50	Q1	Strand (i) Correct money notation 59.5 is Q0 SC2 41.65 SC3 38.37 or 38.38
Alt 8(c)	Their $288 +$ their $228 (= 516)$	M1	
	$5 \times 80 (= 400)$	M1	
	Their $516 \div$ their 400 rounded up (or 2)	M1	
	59.50	Q1	Strand (i) - Correct money notation 59.5 is Q0 SC3 38.37 or 38.38

Q	Answer	Mark	Comments
9(a)(i)	3000	B1	5
	Their $3000 \div 200$	M1	Their 5×3
	15	A1 ft	ft Their 3000 or their 5
9(a)(ii)	Their $15 \times (0.)40$ (or $6(.00)$)	M1	
	2.35	A1 ft	ft Their 15 235 is M1 A0
9(b)(i)	112 (and) 118	B1	
9(b)(ii)	Continues stack heights up to at least 160 (112 118) 124 130 136 142 148 154 160 166...	M2	Allow ft from error in one height M1 Continues stack heights not beyond 160 or Continues stack heights up to at least 160 with ft from error in up to 3 terms
	12	A1	From 160 seen only
	48	B1ft	ft Their 12×4
Alt 9(b)(ii)	$(165 - 106) \div 6$ (or 9.8 ...) or Attempts to add 6's to known stack height, eg, $106 + 6 + 6 + 6 \dots$ oe	M1	oe eg, $(165 - 100) \div 6$ (or 10.8...)
	Their $9 + 3$ or their $9.8 + 3 \dots$) or Adds 6's to stack height to reach 160 eg, $94 + 8 \times 6$ $106 + 6 \times 6$	M1	Their $10 + 2$ or their $10.8 + 2$
	12	A1	SC2 11
	48	B1ft	ft Their 12×4 SC3 44

Q	Answer	Mark	Comments
10(a)	$24 \div (4 + 3 + 1) (= 3)$	M1	$4 \div (4 + 3 + 1) (= \frac{1}{2} \text{ oe})$ or 8 6 2 or 4 (apples) 4 (others)
	$4 \times \text{their } 3$	M1 Dep	$24 \times \text{their } \frac{1}{2} \text{ oe}$ or 12 9 3
	12	A1	
10(b)	$500 \div 20$ (or 1 muffin \rightarrow 25 g cherries) or $400 \div 20$ (or 1 muffin \rightarrow 20 g chocolate)	M1	$500 \div 2$ (or 10 muffins \rightarrow 250 g cherries) or $400 \div 2$ (or 10 muffins \rightarrow 250 g chocolate)
	$500 \div 20$ (or 1 muffin \rightarrow 25 g cherries) and $400 \div 20$ (or 1 muffin \rightarrow 20 g chocolate)	M1	2 muffins \rightarrow 50 g cherries or 2.5 muffins \rightarrow 50 g chocolate
	$200 \div 25$ (or 8) or $150 \div 20$ (or 7.5)	M1	$(200/50) \times 2$ (or 8) or $(150/50) \times 1.5$ (or 7.5)
	7	A1	SC3 8
	Alt 10(b)	$\frac{200}{500}$ or $\frac{150}{400}$	M1
$\frac{200}{500}$ and $\frac{150}{400}$		M1	
Their $\frac{200}{500} \times 20$ (or 8) or their $\frac{150}{400} \times 20$ (or 7.5)		M1	
7		A1	SC3 8

Q	Answer	Mark	Comments
11	$3x + 240 = 525$	M1	oe eg, $x + x + x + 120 + 120 = 525$
	$3x = 525 - 240$	M1	oe eg, $x + x + x = 525 - 120 - 120$
	95	A1 ft	ft From M0 M1 or M1 M0
	Set up and solve a linear equation	Q1	Strand (ii) - Allow one error in the solution of their linear equation
Alt 11	$525 - 240$ (= 285)	M1	
	Their $285 \div 3$	M1	
	95	A1ft	ft From M0 M1 or M1 M0
		Q0	
12	5 (packs of drinks) and 4 (packs of chocolate bars)	B2	B1 60 oe seen or $5n$ (packs of drinks) and $4n$ (packs of chocolate bars) where n is an integer >1 SC1 4 (packs of drinks) and 5 (packs of chocolate bars)
13	4.5 to 4.55 inclusive	B1	
	$52 \div 35$ (= [1.48, 1.5])	M1	
	$1.2(0) \times$ their 4.5 (= 5.4(0))	M1	Their [1.48, 1.5] \div their 4.5 (= [0.32, 0.3])
	No (and) their [1.48, 1.5] (and) their 5.4(0)	A1 ft	No (and) their [0.32, 0.3] ft B0 M2 or B0M1M0
Alt 13	4.5 to 4.55 inclusive	B1	
	$1.2(0) \times$ their 4.5 (= 5.4(0))	M1	
	Their $5.4(0) \times 35$ (= 189)	M1	
	No (and) their 189	A1 ft	ft B0 M2 or B0M0M1

Q	Answer	Mark	Comments
14	$28 \times 16 (= 448)$	M1	
	$\pi \times \left(\frac{25}{2}\right)^2 (= [490.6, 490.94])$	M1	
	$390 + 50 (= 440)$	M1	
	Calculations that enable a comparison to be made eg, (cm ² per penny) their $448 \div 390$ and their $[490.6, 490.94] \div (390 + 50)$	M1	Calculations that enable a comparison to be made eg, (cost per cm ²) $390 \div$ their 448 and $(390 + 50) \div$ their $[490.6, 490.94]$
	[1.14, 1.15] and [1.11, 1.12]	A1	[0.87, 0.871] and [0.89, 0.9]
	Rectangle	Q1 ft	Strand (iii) - Clear strategy seen for comparison with correct conclusion from their figures