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General Certificate of Secondary Education
June 2011

Applications of Mathematics (Pilot) 93701F

(Specification 9370)

Unit 1: Applications of Mathematics
Written Paper (Foundation)

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 candidates' 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 candidates' 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.

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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 $\frac{1}{2}$

A1 Foundation Tier

Q	Answer	Mark	Comments
1(a)(i)	Coffee 6.50 or 3.25 × 2	M1	
	Biscuits 3.36 or 1.12 × 3	M1	
	Total 12.65	A1	
1(a)(ii)	7.35	B1 ft	
1(b)(i)	$\frac{1}{3}$ × 12 or 4 or $\frac{1}{2}$ × 12 or 6	M1	or 4 shaded or 6 shaded
	4 and 6 seen or 10	M1	or 10 shaded
	2	A1	
Alt 1(b)(i)	$\frac{1}{3} + \frac{1}{2}$ or $\frac{5}{6}$	M1	
	(1 – their $\frac{5}{6}$) × 12	M1	
	2	A1	
1(b)(ii)	20 p, 20 p, 20 p, 20 p or 50 p, 20 p, 5 p, 5 p or 50 p, 10 p, 10 p, 10 p	B2	B2 For any 2 correct combinations B1 For one correct combination
2(a)	31 or 32	B1	
2(b)	Scotland	B1	
2(c)	Greatest percentage want to spend time with family for all 3	B1	
2(d)	Bars at 26%, 23% and 30% and shaded correctly as key	B3	B2 For 3 correct lengths without shading OR 2 correct lengths and correct shading B1 For 1 correct length OR 2 correct lengths and no shading

Q	Answer	Mark	Comments
3(a)	67 + 58 + 62 + 71 + 59 + 83 + 74 + 84 + 90	M1	Attempt at Σx Condone 1 error or omission A total of 558 to 738 would imply this mark
	Their 648 ÷ 9	M1 Dep	
	72	A1	
3(b)	Decrease ticked	B1 ft	
	69 is lower than the mean	B1 ft	ft Or correct
4(a)	4 × 60	M1	or 60 ÷ 16
	240 ÷ 16	M1	3.75 × 4
	15 (+ 4 mins spare)	A1	SC2 18 or 19
Alt 4(a)	240 – 12	M1	
	(228 ÷ 16) + 1	M1	
	15	A1	
4(b)	1.25 + 8 × 0.4	M1	
	£4.45 or 445p	A1	SC1 £4.53
5	8 + 9 + 9 + 10 + 7 (= 43)	M1	or 3 hours extra
	40 × 5.78 or 231.2	M1	
	257.21 – their 231.20 (= 26.01)	M1	oe
	Their 26.01 ÷ 3	M1 Dep	
	8.67	A1	
	Key steps shown	Q1	Strand (iii) - All method marks gained and answer given

Q	Answer	Mark	Comments
6(a)	9 + (7 – 5)	M1	oe
	11am or 11.00	A1	
6(b)	70 ÷ 1.45	M1	or 52 × 1.45
	48.2…or 48.3	A1	75.4
	New York as it is only £48.28 (in New York)	A1	New York as £52 is $75.40 oe
7(a)(i)	Tallies correct	B1	
	Frequencies correct 2, 4, 6, 3	B1 ft	ft Their tallies
7(a)(ii)	4	B1 ft	
7(b)	(10 × 1), (11 × 3), (12 × 6), (13 × 3), (14 × 2)	M1	Attempt at $\sum fx$ at least 3 correct products
	10 + 33 + 72 + 39 + 28	M1	At least 3 correct
	182	A1	
7(c)	A complete response, eg Increase length of time **and** change time of day to be busier period / before or after the school day / when people come home from work	B2	oe B1 For one correct comment detailing one of these aspects B1 Count how many people cross the road
8(a)	Fully correct ordered diagram	B2	B1 For 2 lines correct
	Any 2 digit key	B1	
8(b)	Median of red = 15	B1	
	Range of red = 25	B1	
	More at red bus stop (on average) and number at red more varied	B2	B1 Either comment
9(a)	270 ÷ 15	M1	
	18	A1	
9(b)	$\frac{2500 \times 3 \times 4}{100}$ (= 300)	M1	oe
	2500 + their 300	M1 Dep	
	2800	A1	

Q	Answer	Mark	Comments
10(a)	(=) B3 + C3	B1	
10(b)	(D3 =) 216	B1	
	(E3 =) 35	B1	Condone both answers seen in reverse cells
10(c)	(C4 =) 40	B1	SC1 For 40 and 140 in reverse cells
	(D4 =) 140	B1	SC1 For C4 and D4 completed with difference of 100
11(a)	1	B1	
11(b)	4 (+) 3 (+) 5 (+)1	M1	Allow 4 (+) 3 (+) 5 (+) 1(+) 2 (+) 4 (+) 2
	13	A1	21
11(c)	12 + 3 + 6 + 1 + 2 + 1 (= 25)	M1	Allow one error or omission
	$\frac{\text{their } 25}{60} \times 100$	M1 Dep	
	42	A1	Accept 41.6… or 41.7 or 41
12(a)	$135 < h < 160$ or $135 < h$ and $h < 160$ oe	Q2	Q1 For one inequality $135 < h$ or $h < 160$ or for $135 \leq h \leq 160$ Ignore units Strand (i) - Correct notation - inequality signs must be used
12(b)	$x + 2x + 2x + 8$ (= 423) or $5x + 8$ (= 423)	M1	
	$5x = 415$	M1	
	83	A1	
Alt 1 12(b)	Finding 3 values that fit criteria with any total	M1	A total between 400 and 450 implies the 1st M1
	Finding improved values that fit criteria with total between 400 and 450	M1	
	83	A1	
Alt 2 12(b)	423 – 8 or 415 seen	M1	
	$\frac{\text{their } 415}{5}$	M1 Dep	
	83	A1	

Q	Answer	Mark	Comments
13(a)	$\frac{1}{4}$ × 3.8(0) **or** $\frac{3}{4}$ × 5.2(0)	M1	oe Using 25% and 75% or 0.25 and 0.75
	Their 95 p × 5 (= 4.75)	M1 Dep	
	Their 3.90 × 5 (= 19.50)	M1 Dep	Dep On 1st M1
	Their 4.75 + their 19.50	M1 Dep	
	24.25	A1	
Alt 1 13(a)	5 ÷ 4 = 1.25	M1	
	Their 1.25 × 3.80 (= 4.75)	M1 Dep	
	3 × their 1.25 × 5.20 (= 19.50)	M1 Dep	Dep On 1st M1
	Their 4.75 + their 19.50	M1 Dep	
	24.25	A1	
Alt 2 13(a)	$\frac{1}{4}$ × 3.8(0) **or** $\frac{3}{4}$ × 5.2(0)	M1	oe Using 25% and 75% or 0.25 and 0.75
	Their 95 p + their 3.90	M1 Dep	
	Their 4.85 (for 1 kg)	M1 Dep	
	Their 4.85 × 5	M1 Dep	
	24.25	A1	
Alt 3 13(a)	3 × 5.20 = (15.60)	M1	
	3.80 + their 15.60	M1 Dep	
	5 ÷ 4 (= 1.25) or their 19.40 × 5 (= 97)	M1	or $\frac{19.40}{4}$ (= 4.85)
	Their 19.40 × 1.25 or their 97 ÷ 4	M1 Dep	Their 19.40 + their 4.85
	24.25	A1	
13(b)	1.2 seen	B1	
	1.2 × 480	M1	
	£5.76	A1	
Alt 13(b)	4.8 × $\frac{20}{100}$	M1	oe
	4.8 + their 0.96	M1 Dep	
	£5.76	A1	