



General Certificate of Secondary Education

Mathematics 3301

Specification A

Paper 2 Foundation Tier

Mark Scheme

2006 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.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' 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.

The following abbreviations are used on the mark scheme:

M	Method marks awarded for a correct method.
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.
M dep awarded.	A method mark which is dependent on a previous method mark being awarded.
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.
eeoo	Each error or omission.

Paper 2F

1(a)	24, 32	B2	2 answers, 1 correct B1 otherwise –1 eeoo Condone other multiples of 8 as f.w.
1(b)	3, 15	B2	2 answers, 1 correct B1 otherwise –1 eeoo Condone other factors of 45 as f.w.
1(c)	36	B1	

2(a)	Mid-point indicated at (4,2)	B1	$\pm 2\text{mm}$; letter <i>M</i> not necessary
2(b)	(4, 2)	B1ft	
2(c)	Correct line through <i>P</i>	B1	At least 3cm long; check whether the line, if produced, would go within 2mm of (5, 4) and (9,2)

3(a)	39	B1	
3(b)	Subtract 3	B1	oe or –3 written underneath sequence; or $x - 3$, $n - 3$

4(a)(i)	Tangent at A	B1	
4(a)(ii)	Correct diameter	B1	
4(b)(i)	Cuboid	B1	Rectangular prism; but not box
4(b)(ii)	(square based) pyramid	B1	

5	$\frac{3}{15}$, $\frac{6}{30}$	B2	2 answers, 1 correct B1 otherwise –1 eeoo
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6(a)	6.4	B1	
6(b)	Mark in the middle third of 260–280	B1	

7(a)	93000 000	B1	
7(b)(i)	6000	B1	Allow thousand or 1000
7(b)(ii)	276500	B1	

8(a)	Correct reflection	B2	Correct reflection but translated horizontally, B1
8(b)	Rectangle and/or rhombus	B1	Allow diamond
	0	B1	
	2	B1	

9(a)	L,F; S,G; S,F; P,G; P,F	B2	Box full and 5 out of 6 correct B1 Otherwise -1 each omission or repetition
9(b)	7.95 – 1.50	M1	6.45
	their 6.45×16	M1dep	$12.95 \times 16 - 1.50 \times 16$ M2 or $127.2 - 24$
	£103.20	A1	Not 103.2 £118.20 or £112.20 SC2 £118.2 or 122.2 SC1

10(a)	60	B1	
	25	B1	
	te te te xt xt		oe any 2 letters for third picture
10(b)	60	B1	Allow $\pm 2^\circ$
	30	B1	Allow ± 1
10(c)	16s text a lot more than Adults; or 16s make a lot less phone calls than Adults	B1	oe allow twice as much or double; Must be a comparison between 16s and Adults

11(a)	7	B1	
11(b)	$10 - \text{their } 7 \text{ (interger)} \times 1.29$	M1	9.03
	£0.97 (p)	A1	£ sign crossed out, 97p Not £97p unless seen elsewhere

12(a)	$2 \times 75 + 1.40$	M1	Ignore mix of units
	2.90	A1	
12(b)	$515 - 140 (= 375)$	M1	$5.15 - 1.40 (= 3.75)$
	their $375 \div 75$	M1dep	their $3.75 \div 0.75$ M2 for complete build-up method even with numerical errors
	5	A1	

13(a)(i)	78° is acute	B1	
	144° is obtuse	B1	
13(a)(ii)	$360 - (78 + 144)$	M1	oe $360 - 78 - 144$; $360 - 222$
	138	A1	
13(b)	Angles should make total 180°	B1	
	These make 190° , so no	B1	No. These don't

14(a)	7	B1	
14(b)	11	B1	
14(c)	$4z = 9 + 1$ (or 10)	M1	
	2.5	A1	oe
14(d)	$3t + 2t (= 5t) = 19 - 4 (= 15)$	M1	oe allow one sign error
	$5t = 15$	M1dep	$-15 = -5t$
	3	A1	

15	$3 \times 52 (=156)$	M1	$245 - 26 (= 291)$
	their $156 + 26 (= 182)$	M1dep	$3 \times 52 (= 156)$
	$245 - \text{their } 182$	M1dep	their $219 - \text{their } 156$
	63	A1	167 SC2

16(a)	7, 13	B1	
16(b)	Correct plotting on ft to $\frac{1}{2}$ sq	B1ft	Allow one plotting error
	Line from (0, 4) to (5, 19) to $\frac{1}{2}$ sq	B1	
16(c)	Line at least 3cm long to $\frac{1}{2}$ sq	B1	

17(a)	0.308, 0.35, 0.4	B1	
17(b)	15.29	B1	
17(c)(i)	0.08	B1	$\frac{2}{25}$
17(c)(ii)	12.5	B1	
17(d)	Square any number between 0 and 1 inclusive and show it		Square any number greater than 1 and show it B1 (number in correct range) ² but not evaluated or evaluated incorrectly B1

18(a)(i)	(0)34	B1	$\pm 2^\circ$
18(a)(ii)	147	B1	$\pm 2^\circ$
18(a)(iii)	10.7 (cm)	B1	$\pm 0.2\text{cm}; 107 \pm 2$
	Their 10.7×4 (length between 7 and 20)	M1	$\frac{\text{their}107}{100} \times 4$
	42.8	A1ft	Answer in range 42 – 43.6 full marks 44, no working SC2
18(b)	$240 \div 5$	M1	
	48	A1	

19(a)	$36 \div 100 \times 420$	M1	oe allow full method of: 10%, 10%, 10%, 5%, 1%
	151.20	A1	Not 151.2
19(b)	$84 \div 240 \times 100$	M1	oe
	35	A1	
20(a)	1	B1	
20(b)	$3n$	M1	$n + n + n$ but not n^3
	$3n + 7$	A1	$n + n + n + 7$
21(a)	58	B1	
21(b)	13	B1	
21(c)	15	B1	
21(d)	Σx at least 6 values	M1	$11 + 42 + 50 + 36 + 40 + 109$
	their $288 \div$ their 13	M1dep	
	22.(2)	A1	22.1; 22.15(...) or 22 with working
22	$438 \div 6$	M1	73
	365, 73	A1	Accept 73, 365
23	$\pi \times 6$	M1	$2 \times \pi \times 3$; 3.14×6 Not 3×6 or 3.1×6 unless these are clearly stated as π
	18.8 to 18.9	A1	19 with no working SC1

24	Line 4cm, arcs 6cm (above)	B1	All \pm 2mm
	Complete triangle	B1	
	Arcs 6cm (below)	B1	
	Complete rhombus	B1	
	or line 6cm, arcs 4cm and 6cm	B1	or line 2cm, construction 90°
	Complete triangle	B1	Hypotenuse of length 6cm
	Arcs 6cm from 4cm line	B1	Repeat below
	Complete rhombus	B1	Complete rhombus