Free-Standing Mathematics Qualification

Data Handling 4986

Higher Level

Specimen Mark Scheme

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 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.

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Key to mark scheme and abbreviations used in marking

M	mark is for method
m or dM	mark is dependent on one or more M marks and is for method
A	mark is dependent on M or m marks and is for accuracy
B	mark is independent of M or m marks and is for method and accuracy
E	mark is for explanation

√or ft or F	follow through from previous incorrect result	MC	mis-copy
CAO	correct answer only	MR	mis-read
CSO	correct solution only	RA	required accuracy
AWFW	anything which falls within	FW	further work
AWRT	anything which rounds to	ISW	ignore subsequent work
ACF	any correct form	FIW	from incorrect work
AG	answer given	BOD	given benefit of doubt
SC	special case	WR	work replaced by candidate
OE	or equivalent	FB	formulae book
A2,1	2 or 1 (or 0) accuracy marks	NOS	not on scheme
–*x* EE	deduct *x* marks for each error	G	graph
NMS	no method shown	c	candidate
PI	possibly implied	sf	significant figure(s)
SCA	substantially correct approach	dp	decimal place(s)

No Method Shown

Where the question specifically requires a particular method to be used, we must usually see evidence of use of this method for any marks to be awarded. However, there are situations in some units where part marks would be appropriate, particularly when similar techniques are involved. Your Principal Examiner will alert you to these and details will be provided on the mark scheme.

Where the answer can be reasonably obtained without showing working and it is very unlikely that the correct answer can be obtained by using an incorrect method, we must award **full marks**. However, the obvious penalty to candidates showing no working is that incorrect answers, however close, earn **no marks**.

Where a question asks the candidate to state or write down a result, no method need be shown for full marks.

Where the permitted calculator has functions which reasonably allow the solution of the question directly, the correct answer without working earns **full marks**, unless it is given to less than the degree of accuracy accepted in the mark scheme, when it gains **no marks**.

Otherwise we require evidence of a correct method for any marks to be awarded.

Free-Standing Mathematics Qualification
Higher – Data Handling (4986)
Answers and Marking Scheme – Specimen unit

Question 1

(a)	Angle for coal is $\frac{35}{100} \times 360$ = 126° Other angles are 133°,76°,14°, 11° Labelling and accuracy	**M1** **A1** **A1** **B1**	 Any angle correct Dependent on M1
(b)	$\frac{35}{100}$ $= \frac{7}{20}$	**B1**	
	TOTAL	**5**	

Question 2

(a)(i)	Mean of mortgage payment is $\frac{5265}{5}$ = £1053	**M1** **A1**	Either condone £1050
(a)(ii)	Mean of rent is $\frac{4798}{5}$ = £959.60	**A1**	Accept £960
(b)	Suitable scaling Plotting points (within $1\frac{1}{2}$ sq)	**B1** **B2**	must be 400 or 500 per 2cm (must be linear) if not start at 0, max B1 for all points. B1 for 3 correct
(c)	Plot mean point (within $1\frac{1}{2}$ sq, need not be seen) Suitable line	**B1** **B1**	 of length, at least between the points
(d)	£640	**B2**	B2 for £625 to £660 B1 for £600 - £700
	TOTAL	**10**	

Question 3

	A	B	C	D	E
1	**Sunday newspaper**	**Sales in January 2006**	**Sales in January 2007**	**Change in sales**	**Change as a percentage of 2006 sales**
2	Mail on Sunday	2 404 511	2 303 472	– 101 039	– 4.20
3	News of the World	3 789 176	3 426 719	– 362 457	– 9.57
4	People	895 275	761 595	– 133 680	– 14.93
5	Sunday Mirror	1 574 054	1 460 328	– 113 726	– 7.23
6	Sunday Times	1 357 153	1 288 421	– 68 732	– 5.06

(a)(i)	Column D	**B1**	
(ii)	Any in column E correct All of column E Percentages to 2 decimal places	**M1A1** **A1** **B1**	(eg 9.5, 9.6 or 9.5… accept for 9.57) Condone lack of – signs Dependent on M1
(b)	$\frac{D4}{B4}\times 100$	**B1**	Condone $-\frac{D4}{B4}\times 100$
	TOTAL	**6**	

Question 4

(a)	Cumulative frequencies 19, 41, 72, 86, 92, 100 Plot at upper values Plot points accurately Draw curve	**B1** **B1** **B1** **B1**	 need linear scales need linear scales need linear scales
(b)(i)	170	**M1A1**	Accept 155 – 175 need linear scales
(b)(ii)	80	**B1**	Accept 75 – 83 need linear scales
(b)(iii)	340	**B1**	Accept 320 – 360 need linear scales
(b)(iv)	340 – 80 = 260	**B1 ft**	
(c)	Median Quartiles Whiskers	**B1** **B1** **B1**	plot within 1 square plot within 1 square plot within 1 square
	TOTAL	**12**	

Question 5

(a)	Angle is 86° $\frac{86}{360} \times 2627$ £627.56	**B1** **M1** **A1**	Allow 84° – 88° 84 ~ 612.97 85 ~ 620.26 87 ~ 634.86 88 ~ 642.16 Accept £628 or £627
(b)	Radii are 5cm and 4cm ∴ Areas are 25 **:** 16 ∴ Amount spent $= \frac{16}{25} \times 2627$ = £1681	**B1** **M1** **M1** **A1**	 Accept £1681.28, £1680
	TOTAL	**7**	

Question 6

	Approximations are (120 000 or 110 000 and) 500 Number is $\frac{110000}{500}$ = 220	**B1** **M1** **A1**	approximation to 500 Dep B1 above Allow 240, 228, 229, 230 or $\frac{120000}{480} = 250$
	TOTAL	**3**	

Question 7

(a)	1986	**B1**	Allow 1985 - 1987
(b)	US 1992 – 1996	 **B1**	 Accept time period only, must include 92 – 96
(c)	Number of weeks worked is $\frac{1560}{35}$ = 44.57 weeks $\therefore$ 7 [or 8] weeks holiday	**M1** **A1** **A1**	Accept 1580 to 1500 (45.14 – 42.857) (7 – 9.1 weeks) **Or** Number of hours worked in year = 52×35 = 1820 B1 Number of hours not worked = 260 M1 [allow 240 – 320] Number of weeks holiday
	TOTAL	**5**	

Question 8

	Vertical scale 250 should be 150	**B2**	B1 for false zero
	TOTAL	**2**	
	TOTAL MARK FOR PAPER	**50**	