

Mark Scheme (Results)

Summer 2013

Edexcel Level 1 Award (AST10)
Statistical Methods

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk for our BTEC qualifications.

Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson. Their contact details can be found on this link: www.edexcel.com/teachingservices.

You can also use our online Ask the Expert service at www.edexcel.com/ask. You will need an Edexcel username and password to access this service.

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2013

Publications Code EA036972

All the material in this publication is copyright

© Pearson Education Ltd 2013

NOTES ON MARKING PRINCIPLES

- 1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- 2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- 3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- 4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- 5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- 6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:
 - i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.
 - ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.
 - iii) *organise information clearly and coherently, using specialist vocabulary when appropriate.*
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme

M1 – method mark

A1 – accuracy mark

B1 – Working mark

C1 – communication mark

QWC – quality of written communication

oe – or equivalent

cao – correct answer only

ft – follow through

sc – special case

dep – dependent (on a previous mark or conclusion)

indep – independent

isw – ignore subsequent working

PAPER: AST10_01

Question		Working	Answer	Mark	Notes
1	(a)		3, 4	2	B1 for 3 B1 for 4
	(b)		white	1	B1 for white or ft from table
	(c)		20	1	B1 for 20 or ft from table
2	(a)		80	1	B1 cao
	(b)	40+40+40+20	140	1	B1 cao
	(c)	0.25×40	10	2	M1 for 0.25×40 or $1.5 - 1.25$ or sight of 0.25 oe or 60 – 50 A1 cao
3	(a)		30, 10, 35	1	B1 cao
	(b)		Mathematics	1	B1 cao
	(c)		25	1	B1 cao
	(d)		History and Science	1	B1 cao
4			bar chart	3	B1 for linear scale and labels A, B, C and D M1 for at least 2 correct bars A1 for fully correct bars SC B1 for correct bar chart without linear scale and labels on axes NB ignore gaps between bars

PAPER: AST10_01					
Question		Working	Answer	Mark	Notes
5	(a)		evens	1	B1 cao
	(b)		unlikely	1	B1 cao
	(c)(i)		cross marked between 0.75 and 1	2	B1 for cross marked between 0.75 and 1 (do not accept 1)
	(ii)		0		B1 for 0 oe
6	(a)	6+10+7+3	26	2	M1 for 6 + 10 + ... A1 cao
	(b)	6×1+10×2+7×3+3×4 6+20+21+12	59	2	M1 for 6×1+10×2+... oe A1 cao
7	(a)		30	1	B1 cao
	(b)		Thursday	1	B1 cao
	(c)		Bars Kumar 3 Henry 2	2	M1 for two bars with one shaded A1 cao
8	(a)	(M, W), (M, B), (M, G), (T, W), (T, B), (T, G), (V, W), (V, B), (V, G),	9 correct combinations	2	B2 for 9 correct combinations (B1 for at least 4 correct combinations) Ignore repeats
	(b)		$\frac{1}{3}$	1	B1 for $\frac{1}{3}$ oe or ft from part a (min 0.33)

PAPER: AST10_01					
Question		Working	Answer	Mark	Notes
9			3 aspects identified	3	B3 for 3 correct aspects from: 1. non-linear scale (on vertical axis) 2. bars different widths 3. missing tree label 4. missing label (on vertical axis) 5. missing 0 (B2 for 2 correct aspects B1 for 1 correct aspect)
10	(a)	$\frac{(6+7+8+6+7+8+6+11+9+10)}{10}$ $= \frac{78}{10}$	7.8	2	M1 for at least three of $\frac{(6+7+8+\dots)}{10}$ A1 cao
	(b)	11 – 6	5	2	M1 for 11 – 6 or 6 and 11 identified A1 cao
	(c)		comparisons	2	B1 for girls' mean less than boys' mean oe or ft '7.8' B1 for girls' range less than boys' range oe or ft '5'
11			2→perfect negative correlation 3→positive correlation	2	B1 for 2→perfect negative correlation B1 for 3→positive correlation

PAPER: AST10_01					
Question		Working	Answer	Mark	Notes
12	(a)		25	1	B1 cao
	(b)	34 – 14	20	2	M1 for 34 – 14 or 14 and 34 seen A1 cao
13	(a)		$\frac{3}{8}$	2	B2 for $\frac{3}{8}$ (B1 for 3 out of 8 or $\frac{n}{8}, n < 8$ or $\frac{3}{m}, m > 3$)
	(b)		$\frac{5}{8}$	2	M1 for $\frac{2}{8} + \frac{3}{8}$ or $1 - \frac{3}{8}$ A1 for $\frac{5}{8}$ oe

PAPER: AST10_01

Question		Working	Answer	Mark	Notes
14	(a)		7, 11, 4, 2	3	M1 (for using tallies or) at least one correct frequency A1 for two correct frequencies (or tallies) A1 cao
	(b)		10 or more	1	B1 cao
	(c)		5, 27 6, 13 9, 20	3	B3 cao (B2 for 4 or 5 correct B1 for 2 or 3 correct)
	(d)(i)		$\frac{23}{50}$	3	M1 for $\frac{a}{50}$ provided $a < 50$ or $\frac{23}{c}$ and $\frac{15}{d}$ provided $c > 23$ and $d > 15$
	(ii)		$\frac{15}{50}$		A1 for $\frac{23}{50}$ oe A1 for $\frac{15}{50}$ oe
15	(a)	$1 - (0.20 + 0.25 + 0.15)$	0.4	2	M1 for $1 - (0.20 + 0.25 + 0.15)$ A1 for 0.4 oe
	(b)	$1 - (0.2 + 0.25)$	0.55	2	M1 for $1 - (0.2 + 0.25)$ or $0.15 + '0.4'$ A1 for 0.55 oe or ft '0.4'

PAPER: AST10_01

Question		Working	Answer	Mark	Notes
16	(a)		0.5	1	B1 for 0.5 or $\frac{180}{360}$ oe
	(b)		0.25	1	B1 for 0.25 or $\frac{90}{360}$ oe
	(c)	$0.25 \times 60 + \frac{120}{360} \times 60 = 15 + 20$	35	3	M1 for 0.25×60 or $\frac{120}{360} \times 60$ M1 for $0.25 \times 60 + \frac{120}{360} \times 60$ A1 cao
17	(a)		$\frac{79}{110}$	1	B1 for $\frac{79}{110}$ or $\frac{73}{100}$ oe
	(b)		spin the coin more times	1	B1 for spin the coin more times oe
18	(a)		72	1	B1 cao
	(b)	(1, 60), (2, 50), (3, 45), (4, 22)	points plotted and joined	2	M1 for points plotted and joined with line segments, at least 2 points correct. A1 cao
	(c)		downwards	1	B1 for downwards oe
19		angles (120), 60, 72, 108	pie chart	3	M1 for pie chart with at least one correct angle calculated or drawn A1 for all angles drawn correctly B1 for correct data labels in 4 sectors

PAPER: AST10_01									
Question		Working	Answer	Mark	Notes				
20			2 aspects	2	B2 for 2 correct aspects from: 1. no time interval, eg month 2. overlapping intervals 3. no option for 0 or none (B1 for 1 correct aspect)				
21			<table border="1"> <tr> <td>types</td> <td>tally</td> </tr> <tr> <td></td> <td></td> </tr> </table>	types	tally			2	M1 for data collection sheet with column/row labelled types (of crisp) or list of at least 3 types of crisp A1 for column/row labelled tally oe
types	tally								

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email publication.orders@edexcel.com

Order Code EA036972 Summer 2013

For more information on Edexcel qualifications, please visit our website
www.edexcel.com

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

