

GENERAL CERTIFICATE OF SECONDARY EDUCATION

J512/06

MATHEMATICS SPECIFICATION A/B/C

B254

OPTION B (OCR MARKED TASKS)

B266

FOUNDATION/HIGHER TASK B

TO BE COMPLETED BY 19 APRIL 2008

Additional materials: Answer booklet
Electronic calculator
Geometrical instruments



INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces provided on the answer booklet and in the spaces on any graph or squared paper used.

Write your answers on the answer booklet and any graph or squared paper provided.

If appropriate you may fasten notes and computer printout securely to the answer booklet, graph and squared paper with the answer booklet, graph and squared paper on top of any such attached materials.

INFORMATION FOR CANDIDATES

You may use an electronic calculator.

ADVICE TO CANDIDATES

To gain the highest mark possible, you should attempt to include as many of the following features as possible.

Plan the task

- State clearly what your aims are before you work through the task.
- Write a plan that allows you to find out as much as possible about the task.
- State where you will obtain your data.
- If you have to sample data, say how and why you chose the sample, how this might affect your results and what you may have to do to overcome any problems.
- Use correct statistical terms at all times.

Explain your work

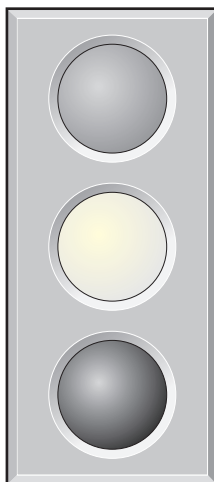
- Show clearly what you have done with your data.
- If you use ICT, include print-outs and explain clearly what the graphs, tables and any figures calculated tell you about your work.
- Use only calculations, graphs or tables that are useful.
- Check carefully that you have not made errors.

State your findings

- Try to write your comments near to the calculations, graphs or tables that you have produced.
- Write comments that explain what your results tell you about the task.
- Say how effective your plan was in helping you find out about the task.
- Say what realistic improvements you could have made to improve the method(s) you used.

This document consists of **6** printed pages and **2** blank pages.

How Good Are Your Reactions?



In some countries traffic lights change straight from red to green. The time a motorist takes to react to this change is their **reaction time**.

Experiments have been carried out to measure reaction times. One such experiment involves measuring the time taken to press a button when a light changes from red to green.

Write one, or more, hypotheses about people's reaction times. Use appropriate data and techniques to test your hypotheses, planning and specifying your methods carefully and stating your aims clearly.

- A sample of data for the experiment described above is given in the following table. It has been taken from <http://experimentsatschool.org.uk/>.
- You may wish to log on to the website and visit the experiment 'Reaction timer' to obtain further data. You may choose to use other data about reaction times.

Reaction times in seconds.

All data from – UK Phase 4 CensusAtSchool.

NB This is raw data and may well contain some errors!

Region	Gender	Age in years	Hand normally used for writing	Reaction, left hand (seconds)	Reaction, right hand (seconds)
East Midlands	F	15	left	0.22	0.22
East Midlands	F	15	right	0.22	0.22
East Midlands	M	15	right	1.7185	0.2575
East Midlands	M	15	right	0.385	0.36
East Midlands	M	15	right	0.19	0.11
East Midlands	F	15	right	0.22	0.22
East Midlands	F	15	right	0.3	0.22
East Midlands	F	15	right	0.3	0.305
East Midlands	M	15	right	0.33	0.355
East Midlands	F	15	right	0.305	0.305
East Midlands	M	15	right	0.2265	0.2735
East Midlands	M	15	right	0.3	0.16
East Midlands	M	15	right	0.22	0.245
East Midlands	M	15	right	0.2145	0.19
East Midlands	F	15	right	0.88	0.355
East Midlands	F	15	right	0.385	0.3
East Midlands	F	15	right	0.28	0.305
East Midlands	F	15	right	0.28	0.22
East Midlands	M	15	right	0.22	0.135
East Midlands	M	15	left	0.22	0.19
East Midlands	F	15	right	0.335	0.385
East Midlands	M	15	right	0.25	0.275
East Midlands	F	15	right	0.305	0.415
East Midlands	F	15	right	0.266	0.241
Home Counties	F	15	right	0.28	0.275
London	F	15	right	0.245	0.22
North East	F	15	left	0.133	0.3595
North West	F	15	right	0.25	0.22
North West	M	15	left	0.1955	0.111
North West	M	15	right	0.6005	2.6585
North West	M	15	right	0.6005	2.6585
North West	F	15	right	0.2305	0.24
North West	M	15	right	0.41	0.25
North West	F	15	right	0.4925	0.2655
North West	M	15	right	0.164	0.047
North West	F	15	right	0.321	0.266
North West	F	15	right	0.25	0.203
North West	F	15	right	0.24	0.33
North West	M	15	right	0.25	0.21
North West	M	15	right	0.225	0.245
North West	M	15	right	0.255	0.255

Region	Gender	Age in years	Hand normally used for writing	Reaction, left hand (seconds)	Reaction, right hand (seconds)
North West	M	15	right	0.6355	0.3105
Scotland	F	15	right	0.3	0.245
South	F	15	left	0.19	0.21
South	M	15	right	0.22	0.2055
South	F	15	left	0.245	0.2005
South	F	15	right	0.2755	0.19
South	M	15	right	0.245	0.22
South	M	15	right	0.2605	1.062
South	M	15	right	0.2155	0.1655
South East	F	15	right	4.745	3.98
South Wales	F	15	right	0.275	0.245
West Midlands	F	15	right	0.211	0.2185
West Midlands	M	15	right	0.188	0.1875
West Midlands	F	15	right	0.2265	0.211
West Midlands	F	15	right	0.203	0.203
West Midlands	F	15	right	0.203	0.1015
West Midlands	M	15	left	0.2265	0.203
East	F	12	right	0.22	0.22
East	F	12	right	0.435	0.335
East	M	12	right	0.11	0.115
East	F	12	right	0.22	0.215
East	M	12	left	0.55	0.465
East	F	12	left	0.33	0.3
East	F	12	right	0.77	0.38
East	F	12	left	0.165	0.22
East	F	12	right	0.601	0.29
East	F	12	left	0.305	0.275
East	F	12	either	2.665	0.74
East	F	12	right	0.195	0.28
East Midlands	F	12	right	0.3205	0.326
East Midlands	F	12	right	0.2755	0.285
East Midlands	M	12	left	0.2425	0.4295
East Midlands	F	12	right	0.355	0.25
East Midlands	F	12	right	0.242	0.508
East Midlands	M	12	either	0.305	0.96
East Midlands	M	12	right	0.465	0.27
East Midlands	F	12	left	0.265	0.306
East Midlands	M	12	right	0.71	13.21
East Midlands	M	12	right	3.0015	4.9195
East Midlands	F	12	right	0.331	0.3365
East Midlands	F	12	right	0.25	0.25
East Midlands	F	12	right	0.33	0.36
East Midlands	F	12	right	0.221	0.265
East Midlands	M	12	left	1.345	0.715

Region	Gender	Age in years	Hand normally used for writing	Reaction, left hand (seconds)	Reaction, right hand (seconds)
East Midlands	M	12	right	0.235	0.2305
East Midlands	M	12	right	0.985	1.925
East Midlands	F	12	right	0.2555	0.2605
East Midlands	M	12	right	0.256	0.311
East Midlands	M	12	right	0.5395	1.7815
East Midlands	F	12	right	0.651	0.746
East Midlands	M	12	left	2.6085	1.046
East Midlands	F	12	right	1.142	0.2655
East Midlands	M	12	right	0.245	0.271
East Midlands	M	12	right	0.1015	1.828
East Midlands	M	12	right	0.2605	0.281
East Midlands	F	12	right	0.32	0.4145
East Midlands	F	12	right	2.6435	0.325
East Midlands	M	12	right	0.33	0.245
East Midlands	M	12	right	0.3	0.495
East Midlands	M	12	right	0.36	0.41
East Midlands	M	12	right	0.175	0.236
East Midlands	F	12	right	0.275	0.245
East Midlands	M	12	right	0.328	0.328
East Midlands	F	12	left	0.1605	0.5155
East Midlands	F	12	either	0.276	0.266
East Midlands	M	12	right	0.195	0.21
East Midlands	F	12	right	0.25	0.2745
East Midlands	F	12	right	0.24	0.235
East Midlands	F	12	right	0.285	0.2405
East Midlands	F	12	right	0.291	0.536
East Midlands	F	12	left	0.3005	0.2905
East Midlands	F	12	left	0.2855	0.3005
East Midlands	F	12	right	0.563	0.2655
East Midlands	M	12	right	0.63	0.435
Home Counties	M	12	right	1.0715	0.892
Home Counties	M	12	right	0.25	0.211
Home Counties	M	12	right	0.495	0.25
Home Counties	F	12	right	2.5785	1.1715
Home Counties	M	12	right	0.2345	0.1955
Home Counties	F	12	right	0.2735	0.2575
Home Counties	M	12	right	0.215	0.025
Home Counties	M	12	right	0.41	0.245
Home Counties	F	12	right	0.275	0.275
Home Counties	F	12	right	0.242	0.289
Home Counties	M	12	left	0.28	0.245
Home Counties	F	12	right	0.325	0.385
Home Counties	M	12	right	0.2205	0.221

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