HIGHER

1.8 Pilot Surveys (Higher): 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A pilot survey about a town library found this problem: "Pilot respondents gave very different readings of the word 'often'."

(a) Explain what the problem suggests about the questionnaire.

(b) State what should be done before the main survey.

(Total for Question 1 is 2 marks)

2 A survey asks how many hours per week people spend on a town library. The response boxes are: 1 to 6, 6 to 11, 11 to 16.

(a) Explain what is wrong with these response boxes, giving a value that could go in two boxes.

(b) Write down a better set of three response boxes starting from 1.

(Total for Question 2 is 3 marks)

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3 A matched pairs experiment tests a revision method. Pairs of students with similar past marks were chosen; one in each pair used the method (after) and the other did not (before).

Pair	Without method	With method
Pair 1	41	42
Pair 2	55	61
Pair 3	41	53
Pair 4	76	74
Pair 5	52	63
Pair 6	65	61
Pair 7	42	41

(a) Work out the difference (with minus without) for each pair.
(b) Work out the mean difference. Give your answer to 2 decimal places if needed.

(Total for Question 3 is 4 marks)

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4 A survey asks how many hours per week people spend on a school trip. The response boxes are: 1 to 4, 4 to 7, 7 to 10.
(a) Explain what is wrong with these response boxes, giving a value that could go in two boxes.
(b) Write down a better set of three response boxes starting from 1.

(Total for Question 4 is 3 marks)

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5 A matched pairs experiment tests a revision method. Pairs of students with similar past marks were chosen; one in each pair used the method (after) and the other did not (before).

Pair	Without method	With method
Pair 1	46	46
Pair 2	41	52
Pair 3	74	77
Pair 4	67	65
Pair 5	83	83

(a) Work out the difference (with minus without) for each pair.
(b) Work out the mean difference. Give your answer to 2 decimal places if needed.

(Total for Question 5 is 4 marks)

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6 A pilot survey about bus services found this problem: "Pilot respondents gave very different readings of the word 'often'."
(a) Explain what the problem suggests about the questionnaire.
(b) State what should be done before the main survey.

(Total for Question 6 is 2 marks)

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7 Isla repeats an experiment 5 times and records the time in seconds for a ball to roll down a ramp.

27, 4, 31, 31, 31

(a) Write down the value that looks anomalous.
(b) Work out the mean of the remaining 4 values. Give your answer to 1 decimal place if needed.
(c) Give one reason for repeating an experiment.

(Total for Question 7 is 4 marks)

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8 A student writes this question for a survey about bus services:

"Do you agree that bus services is clearly excellent and that everyone should support it?"

(a) Give one reason why this is a poor question.
(b) Write a better question.

(Total for Question 8 is 3 marks)

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9 36 volunteers take part in a trial of a sleep aid. Half are to receive the sleep aid and half a placebo (a pill with no active ingredient).
(a) How many volunteers are in each group?
(b) Give one reason for using a placebo.
(c) Describe how the volunteers could be allocated to groups at random.

(Total for Question 9 is 3 marks)

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10 A survey asks how many hours per week people spend on a town library. The response boxes are: 1 to 3, 3 to 5, 5 to 7.

(a) Explain what is wrong with these response boxes, giving a value that could go in two boxes.

(b) Write down a better set of three response boxes starting from 1.

(Total for Question 10 is 3 marks)

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11 Kofi repeats an experiment 6 times and records the reaction time in hundredths of a second.

48, 52, 49, 26, 51, 54

(a) Write down the value that looks anomalous.

(b) Work out the mean of the remaining 5 values. Give your answer to 1 decimal place if needed.

(c) Give one reason for repeating an experiment.

(Total for Question 11 is 4 marks)

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12 A pilot survey about mobile phone use in lessons was given to 5 people and took 90 minutes in total to complete.

(a) Work out the mean time per person.

(b) Estimate the total time needed to survey 200 people, in minutes.

(c) Give one reason for carrying out a pilot survey.

(Total for Question 12 is 4 marks)

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13 Ben repeats an experiment 6 times and records the time in seconds for a ball to roll down a ramp.

45, 42, 66, 44, 41, 42

(a) Write down the value that looks anomalous.
(b) Work out the mean of the remaining 5 values. Give your answer to 1 decimal place if needed.
(c) Give one reason for repeating an experiment.

(Total for Question 13 is 4 marks)

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14 A matched pairs experiment tests a revision method. Pairs of students with similar past marks were chosen; one in each pair used the method (after) and the other did not (before).

Pair	Without method	With method
Pair 1	43	52
Pair 2	83	79
Pair 3	62	74
Pair 4	41	39
Pair 5	79	83

(a) Work out the difference (with minus without) for each pair.
(b) Work out the mean difference. Give your answer to 2 decimal places if needed.

(Total for Question 14 is 4 marks)

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15 A survey about healthy eating includes the question "How much money does your family earn each year?" with an empty box for the answer.

(a) Give one reason why many people may not answer this.

(b) Suggest how the question could be changed to make people more willing to answer.

(Total for Question 15 is 2 marks)

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16 Freya repeats an experiment 6 times and records the length in millimetres of a spring after loading.

44, 40, 16, 38, 39, 43

(a) Write down the value that looks anomalous.

(b) Work out the mean of the remaining 5 values. Give your answer to 1 decimal place if needed.

(c) Give one reason for repeating an experiment.

(Total for Question 16 is 4 marks)

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17 In a pilot, 20 questionnaires about a local park were sent out and 5 were returned.

(a) Work out the response rate as a percentage, to 1 decimal place if needed.

(b) The main survey needs 400 returned questionnaires. Estimate how many must be sent out if the response rate stays the same. Round up to a whole number.

(Total for Question 17 is 4 marks)

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Mark scheme · 1.8 Pilot Surveys (Higher): 1-hour Pack

Question 1

identifies the likely issue: the wording is vague	B1
changes the questionnaire: give numerical response boxes	B1

Answer: the wording is vague, so give numerical response boxes

Question 2

the boxes overlap, e.g. 6 fits in two boxes	B1
a set of non-overlapping classes with no gaps	M1
e.g. 1 to 5, 6 to 10, 11 to 15 (or inequalities)	A1

Answer: (a) the boxes overlap, for example 6 fits in two boxes; (b) non-overlapping boxes such as 1 to 5, 6 to 10, 11 to 15

Question 3

with minus without for at least half the pairs	M1
differences 1, 6, 12, -2, 11, -4, -1 cao	A1
sum of differences divided by 7	M1
3.29 cao	A1

Answer: (a) 1, 6, 12, -2, 11, -4, -1; (b) 3.29

Question 4

the boxes overlap, e.g. 4 fits in two boxes	B1
a set of non-overlapping classes with no gaps	M1
e.g. 1 to 3, 4 to 6, 7 to 9 (or inequalities)	A1

Answer: (a) the boxes overlap, for example 4 fits in two boxes; (b) non-overlapping boxes such as 1 to 3, 4 to 6, 7 to 9

Question 5

with minus without for at least half the pairs	M1
differences 0, 11, 3, -2, 0 cao	A1
sum of differences divided by 5	M1
2.4 cao	A1

Answer: (a) 0, 11, 3, -2, 0; (b) 2.4

Question 6

identifies the likely issue: the wording is vague	B1
changes the questionnaire: give numerical response boxes	B1

Answer: the wording is vague, so give numerical response boxes

Question 7

4	B1
sum of the 4 remaining values divided by 4	M1
30 cao	A1
to improve reliability / to spot anomalies / to reduce the effect of random error	B1

Answer: (a) 4; (b) 30; (c) to improve reliability

Question 8

it is a leading question (it pushes the respondent towards one answer)	B1
a neutral wording with no persuasion	M1
includes a range of response options (closed) or is clearly open and unbiased	A1

Answer: (a) leading question; (b) e.g. What is your opinion of bus services? (very good, good, neutral, poor, very poor)

Question 9

18 in each group	B1
so the effect of believing in the treatment is the same for both groups (acts as a control)	B1
e.g. give each volunteer a number and use random numbers or draw names from a hat for the treatment group	B1

Answer: (a) 18; (b) a placebo acts as a control; (c) use random numbers or draw names to allocate

Question 10

the boxes overlap, e.g. 3 fits in two boxes	B1
a set of non-overlapping classes with no gaps	M1
e.g. 1 to 2, 3 to 4, 5 to 6 (or inequalities)	A1

Answer: (a) the boxes overlap, for example 3 fits in two boxes; (b) non-overlapping boxes such as 1 to 2, 3 to 4, 5 to 6

Question 11

26	B1
sum of the 5 remaining values divided by 5	M1
50.8 cao	A1
to improve reliability / to spot anomalies / to reduce the effect of random error	B1

Answer: (a) 26; (b) 50.8; (c) to improve reliability

Question 12

90 / 5	M1
18 minutes	A1
3600 minutes	B1
to test the questions / check they are understood / estimate time and cost before the full survey	B1

Answer: (a) 18 minutes; (b) 3600 minutes; (c) to test the questions before the full survey

Question 13

66	B1
sum of the 5 remaining values divided by 5	M1
42.8 cao	A1
to improve reliability / to spot anomalies / to reduce the effect of random error	B1

Answer: (a) 66; (b) 42.8; (c) to improve reliability

Question 14

with minus without for at least half the pairs	M1
differences 9, -4, 12, -2, 4 cao	A1
sum of differences divided by 5	M1
3.8 cao	A1

Answer: (a) 9, -4, 12, -2, 4; (b) 3.8

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Question 15

personal or sensitive question, so people may refuse or give false answers	**B1**
use response boxes with ranges (e.g. under 20 000, 20 000 to 40 000, over 40 000) or make the survey anonymous	**B1**

Answer: (a) the question is personal and sensitive; (b) use income ranges or make the survey anonymous

Question 16

16	**B1**
sum of the 5 remaining values divided by 5	**M1**
40.8 cao	**A1**
to improve reliability / to spot anomalies / to reduce the effect of random error	**B1**

Answer: (a) 16; (b) 40.8; (c) to improve reliability

Question 17

5/20 x 100	**M1**
25% cao	**A1**
400 / (1/4) or 400 x 20/5	**M1**
1600 cao	**A1**

Answer: (a) 25%; (b) 1600

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