HIGHER

1.7 Estimating from Samples (Higher): 1-hour Pack

Total Marks

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 To estimate the number of badgers in a woodland, 30 are caught, marked and released. Later, 40 are caught and 2 of them are marked.
(a) Estimate the total number of badgers in a woodland.
(b) State one assumption you have made.

(Total for Question 1 is 3 marks)

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2 Two surveys estimate the proportion of members of a gym who cycle. Survey A: 13 of 25 cycle. Survey B: 56 of 100 cycle.
(a) Work out the proportion who cycle in each survey as a percentage, to 1 decimal place if needed.
(b) Which survey is likely to give the more reliable estimate, and why?

(Total for Question 2 is 4 marks)

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3 A random sample of 10 of the 500 parcels sent by a firm last week had a mean mass of 34 kg. Estimate the total mass of all 500 parcels.

(Total for Question 3 is 2 marks)

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4 To estimate the number of frogs in a pond, 40 are caught, marked and released. Later, 20 are caught and 4 of them are marked.

(a) Estimate the total number of frogs in a pond.

(b) State one assumption you have made.

(Total for Question 4 is 3 marks)

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5 A random sample of 40 residents of a town was taken. 8 of them have a library card. There are 2000 residents of the town altogether. Estimate the number of residents of the town who have a library card. Give your answer to the nearest whole number.

(Total for Question 5 is 3 marks)

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6 A random sample of 200 residents of a town was taken. 87 of them use a bike. There are 1200 residents of the town altogether. Estimate the number of residents of the town who use a bike. Give your answer to the nearest whole number.

(Total for Question 6 is 3 marks)

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7 To estimate the number of deer in a park, 40 are caught, marked and released. Later, 20 are caught and 5 of them are marked.

(a) Estimate the total number of deer in a park.

(b) State one assumption you have made.

(Total for Question 7 is 3 marks)

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8 A random sample of 200 residents of a town was taken. 16 of them own a pet. There are 5000 residents of the town altogether. Estimate the number of residents of the town who own a pet. Give your answer to the nearest whole number.

(Total for Question 8 is 3 marks)

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9 A random sample of 80 members of a gym was taken. 9 of them have a library card. There are 2500 members of the gym altogether. Estimate the number of members of the gym who have a library card. Give your answer to the nearest whole number.

(Total for Question 9 is 3 marks)

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10 A random sample of 100 members of a gym was taken. 17 of them have a library card. There are 5000 members of the gym altogether. Estimate the number of members of the gym who have a library card. Give your answer to the nearest whole number.

(Total for Question 10 is 3 marks)

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11 A random sample of 200 residents of a town was taken. 21 of them use a bike. There are 2500 residents of the town altogether. Estimate the number of residents of the town who use a bike. Give your answer to the nearest whole number.

(Total for Question 11 is 3 marks)

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12 To estimate the number of fish in a lake, 80 are caught, marked and released. Later, 30 are caught and 3 of them are marked.

(a) Estimate the total number of fish in a lake.

(b) State one assumption you have made.

(Total for Question 12 is 3 marks)

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13 Two surveys estimate the proportion of members of a gym who cycle. Survey A: 22 of 25 cycle. Survey B: 180 of 200 cycle.

(a) Work out the proportion who cycle in each survey as a percentage, to 1 decimal place if needed.

(b) Which survey is likely to give the more reliable estimate, and why?

(Total for Question 13 is 4 marks)

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14 Two surveys estimate the proportion of visitors to a museum who cycle. Survey A: 8 of 25 cycle. Survey B: 36 of 100 cycle.

(a) Work out the proportion who cycle in each survey as a percentage, to 1 decimal place if needed.

(b) Which survey is likely to give the more reliable estimate, and why?

(Total for Question 14 is 4 marks)

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15 To estimate the number of beetles in a field, 80 are caught, marked and released. Later, 60 are caught and 20 of them are marked.

(a) Estimate the total number of beetles in a field.

(b) State one assumption you have made.

(Total for Question 15 is 3 marks)

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16 A random sample of 100 members of a gym was taken. 37 of them read a paper. There are 2000 members of the gym altogether. Estimate the number of members of the gym who read a paper. Give your answer to the nearest whole number.

(Total for Question 16 is 3 marks)

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17 A random sample of 200 students in a school was taken. 34 of them have a library card. There are 1000 students in the school altogether. Estimate the number of students in the school who have a library card. Give your answer to the nearest whole number.

(Total for Question 17 is 3 marks)

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18 To estimate the number of badgers in a woodland, 30 are caught, marked and released. Later, 40 are caught and 6 of them are marked.

(a) Estimate the total number of badgers in a woodland.

(b) State one assumption you have made.

(Total for Question 18 is 3 marks)

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19 A random sample of 40 visitors to a museum was taken. 7 of them have a library card. There are 3000 visitors to the museum altogether. Estimate the number of visitors to the museum who have a library card. Give your answer to the nearest whole number.

(Total for Question 19 is 3 marks)

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Mark scheme · 1.7 Estimating from Samples (Higher): 1-hour Pack

Question 1

30 x 40 / 2	**M1**
600 cao	**A1**
e.g. the population has not changed between catches (no births, deaths, or migration), or marked ones mix back evenly	**B1**

Answer: (a) 600; (b) the population is unchanged between the two catches

Question 2

13/25 x 100 or 56/100 x 100	**M1**
52% and 56% cao	**A1**
Survey B	**B1**
it has a larger sample (100 compared with 25)	**B1**

Answer: (a) 52% and 56%; (b) Survey B, larger sample

Question 3

500 x 34	**M1**
17000 kg cao	**A1**

Answer: 17000 kg

Question 4

40 x 20 / 4	**M1**
200 cao	**A1**
e.g. the population has not changed between catches (no births, deaths, or migration), or marked ones mix back evenly	**B1**

Answer: (a) 200; (b) the population is unchanged between the two catches

Question 5

8/40	**M1**
1/5 x 2000	**M1**
400 cao	**A1**

Answer: 400

Question 6

87/200	**M1**
87/200 x 1200	**M1**
522 cao	**A1**

Answer: 522

Question 7

40 x 20 / 5	**M1**
160 cao	**A1**
e.g. the population has not changed between catches (no births, deaths, or migration), or marked ones mix back evenly	**B1**

Answer: (a) 160; (b) the population is unchanged between the two catches

Question 8

16/200	**M1**
2/25 x 5000	**M1**
400 cao	**A1**

Answer: 400

Question 9

9/80	**M1**
9/80 x 2500	**M1**
281 cao	**A1**

Answer: 281

Question 10

17/100	**M1**
17/100 x 5000	**M1**
850 cao	**A1**

Answer: 850

Question 11

21/200	**M1**
21/200 x 2500	**M1**
263 cao	**A1**

Answer: 263

Question 12

80 x 30 / 3	**M1**
800 cao	**A1**
e.g. the population has not changed between catches (no births, deaths, or migration), or marked ones mix back evenly	**B1**

Answer: (a) 800; (b) the population is unchanged between the two catches

Question 13

22/25 x 100 or 180/200 x 100	**M1**
88% and 90% cao	**A1**
Survey B	**B1**
it has a larger sample (200 compared with 25)	**B1**

Answer: (a) 88% and 90%; (b) Survey B, larger sample

Question 14

8/25 x 100 or 36/100 x 100	**M1**
32% and 36% cao	**A1**
Survey B	**B1**
it has a larger sample (100 compared with 25)	**B1**

Answer: (a) 32% and 36%; (b) Survey B, larger sample

Question 15

80 x 60 / 20	**M1**
240 cao	**A1**
e.g. the population has not changed between catches (no births, deaths, or migration), or marked ones mix back evenly	**B1**

Answer: (a) 240; (b) the population is unchanged between the two catches

Question 16

37/100	**M1**
37/100 x 2000	**M1**
740 cao	**A1**

Answer: 740

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Question 17

34/200	**M1**
17/100 x 1000	**M1**
170 cao	**A1**

Answer: 170

Question 18

30 x 40 / 6	**M1**
200 cao	**A1**
e.g. the population has not changed between catches (no births, deaths, or migration), or marked ones mix back evenly	**B1**

Answer: (a) 200; (b) the population is unchanged between the two catches

Question 19

7/40	**M1**
7/40 x 3000	**M1**
525 cao	**A1**

Answer: 525

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