FOUNDATION

# 1.2 Estimating from Samples (Foundation): 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** A survey of 200 club members uses a stratified sample of 60. The numbers in each group are in the table.

| Group | Number |
|---|---|
| juniors | 20 |
| seniors | 50 |
| veterans | 100 |
| guests | 30 |

Work out how many should be sampled from each group.

**(Total for Question 1 is 3 marks)**

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**2** A random sample of 200 students in a school was taken. 91 of them have a library card. There are 2500 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 2 is 3 marks)**


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**3** A survey of 120 customers uses a stratified sample of 60. The numbers in each group are in the table.

| Group | Number |
|---|---|
| students | 40 |
| adults | 60 |
| pensioners | 20 |

Work out how many should be sampled from each group.

**(Total for Question 3 is 3 marks)**

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**4** A survey of 150 club members uses a stratified sample of 30. The numbers in each group are in the table.

| Group | Number |
|---|---|
| juniors | 80 |
| seniors | 50 |
| veterans | 20 |

Work out how many should be sampled from each group.

**(Total for Question 4 is 3 marks)**

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**5** A random sample of 80 residents of a town was taken. 25 of them use a bike. There are 1000 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 5 is 3 marks)**


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**6** A survey of 150 club members uses a stratified sample of 30. The numbers in each group are in the table.

| Group | Number |
|---|---|
| juniors | 50 |
| seniors | 20 |
| veterans | 80 |

Work out how many should be sampled from each group.

**(Total for Question 6 is 3 marks)**

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**7** A random sample of 80 students in a school was taken. 31 of them read a paper. There are 1200 students in the school altogether. Estimate the number of students in the school who read a paper. Give your answer to the nearest whole number.

**(Total for Question 7 is 3 marks)**

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**8** A survey of 400 farm animals uses a stratified sample of 100. The numbers in each group are in the table.

| Group | Number |
|---|---|
| cows | 100 |
| sheep | 200 |
| pigs | 100 |

Work out how many should be sampled from each group.

**(Total for Question 8 is 3 marks)**


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**9** Two surveys estimate the proportion of visitors to a museum who cycle. Survey A: 15 of 25 cycle. Survey B: 117 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 9 is 4 marks)**

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**10** A survey of 240 staff uses a stratified sample of 30. The numbers in each group are in the table.

| Group | Number |
|---|---|
| teachers | 120 |
| technicians | 80 |
| administrators | 40 |

Work out how many should be sampled from each group.

**(Total for Question 10 is 3 marks)**


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**11** A survey of 500 club members uses a stratified sample of 50. The numbers in each group are in the table.

| Group | Number |
|---|---|
| juniors | 200 |
| seniors | 200 |
| veterans | 20 |
| guests | 80 |

Work out how many should be sampled from each group.

**(Total for Question 11 is 3 marks)**

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**12** A random sample of 10 of the 200 parcels sent by a firm last week had a mean mass of 64 kg. Estimate the total mass of all 200 parcels.

**(Total for Question 12 is 2 marks)**


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**13** A survey of 500 club members uses a stratified sample of 50. The numbers in each group are in the table.

| Group | Number |
|---|---|
| juniors | 80 |
| seniors | 120 |
| veterans | 200 |
| guests | 100 |

Work out how many should be sampled from each group.

**(Total for Question 13 is 3 marks)**

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**14** A stratified sample is taken from 120 club members. There are 30 veterans in the population, and 15 veterans are in the sample.

(a) Work out the sampling fraction in its simplest form.

(b) Work out the total size of the sample.

**(Total for Question 14 is 4 marks)**

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**15** A random sample of 50 visitors to a museum was taken. 5 of them read a paper. There are 3000 visitors to the museum altogether. Estimate the number of visitors to the museum who read a paper. Give your answer to the nearest whole number.

**(Total for Question 15 is 3 marks)**


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**16** A survey of 500 customers uses a stratified sample of 100. The numbers in each group are in the table.

| Group | Number |
|---|---|
| students | 100 |
| adults | 150 |
| pensioners | 100 |
| children | 150 |

Work out how many should be sampled from each group.

**(Total for Question 16 is 3 marks)**

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**17** A survey of 400 club members uses a stratified sample of 50. The numbers in each group are in the table.

| Group | Number |
|---|---|
| juniors | 200 |
| seniors | 80 |
| veterans | 40 |
| guests | 80 |

Work out how many should be sampled from each group.

**(Total for Question 17 is 3 marks)**


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**18** Two surveys estimate the proportion of members of a gym who cycle. Survey A: 6 of 50 cycle. Survey B: 27 of 250 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 18 is 4 marks)**

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**19** A survey of 100 students uses a stratified sample of 50. The numbers in each group are in the table.

| Group | Number |
|---|---|
| Year 7 | 40 |
| Year 8 | 40 |
| Year 9 | 20 |

Work out how many should be sampled from each group.

**(Total for Question 19 is 3 marks)**


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# Mark scheme · 1.2 Estimating from Samples (Foundation): 1-hour Pack

## Question 1

| | |
|---|---|
| sample size / population = 60/200 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 6, 15, 30, 9 cao | **A1** |

**Answer: 6, 15, 30, 9**

## Question 2

| | |
|---|---|
| 91/200 | **M1** |
| 91/200 x 2500 | **M1** |
| 1138 cao | **A1** |

**Answer: 1138**

## Question 3

| | |
|---|---|
| sample size / population = 60/120 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 20, 30, 10 cao | **A1** |

**Answer: 20, 30, 10**

## Question 4

| | |
|---|---|
| sample size / population = 30/150 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 16, 10, 4 cao | **A1** |

**Answer: 16, 10, 4**

## Question 5

| | |
|---|---|
| 25/80 | **M1** |
| 5/16 x 1000 | **M1** |
| 313 cao | **A1** |

**Answer: 313**

## Question 6

| | |
|---|---|
| sample size / population = 30/150 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 10, 4, 16 cao | **A1** |

**Answer: 10, 4, 16**

## Question 7

| | |
|---|---|
| 31/80 | **M1** |
| 31/80 x 1200 | **M1** |
| 465 cao | **A1** |

**Answer: 465**

## Question 8

| | |
|---|---|
| sample size / population = 100/400 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 25, 50, 25 cao | **A1** |

**Answer: 25, 50, 25**

## Question 9

| | |
|---|---|
| 15/25 x 100 or 117/200 x 100 | **M1** |
| 60% and 58.5% cao | **A1** |
| Survey B | **B1** |
| it has a larger sample (200 compared with 25) | **B1** |

**Answer: (a) 60% and 58.5%; (b) Survey B, larger sample**

## Question 10

| | |
|---|---|
| sample size / population = 30/240 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 15, 10, 5 cao | **A1** |

**Answer: 15, 10, 5**

## Question 11

| | |
|---|---|
| sample size / population = 50/500 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 20, 20, 2, 8 cao | **A1** |

**Answer: 20, 20, 2, 8**

## Question 12

| | |
|---|---|
| 200 x 64 | **M1** |
| 12800 kg cao | **A1** |

**Answer: 12800 kg**

## Question 13

| | |
|---|---|
| sample size / population = 50/500 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 8, 12, 20, 10 cao | **A1** |

**Answer: 8, 12, 20, 10**

## Question 14

| | |
|---|---|
| 15/30 | **M1** |
| 1/2 oe | **A1** |
| 120 x 1/2 | **M1** |
| 60 cao | **A1** |

**Answer: (a) 1/2; (b) 60**

## Question 15

| | |
|---|---|
| 5/50 | **M1** |
| 1/10 x 3000 | **M1** |
| 300 cao | **A1** |

**Answer: 300**

## Question 16

| | |
|---|---|
| sample size / population = 100/500 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 20, 30, 20, 30 cao | **A1** |

**Answer: 20, 30, 20, 30**

## Question 17

| | |
|---|---|
| sample size / population = 50/400 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 25, 10, 5, 10 cao | **A1** |

**Answer: 25, 10, 5, 10**

## Question 18

| | |
|---|---|
| 6/50 x 100 or 27/250 x 100 | **M1** |
| 12% and 10.8% cao | **A1** |
| Survey B | **B1** |
| it has a larger sample (250 compared with 50) | **B1** |

**Answer: (a) 12% and 10.8%; (b) Survey B, larger sample**


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## Question 19

| | |
|---|---|
| sample size / population = 50/100 | **M1** |
| group size x sampling fraction for at least one group | **M1** |
| 20, 20, 10 cao | **A1** |

**Answer: 20, 20, 10**


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