Capture Recapture

Grade 6 topic · Higher tier · Edexcel and AQA

How to use this pack
20 questions that get harder as you go. Questions 1–15 (58 marks) build up to the harder Grade 8–9 style questions at the end; aim to complete all 20. Show your working on the lines and write your final answer on the answer line, then mark yourself with the answers at the back. Diagrams are not drawn accurately. Total: 80 marks.

Warm-up

1 40 fish are caught, marked and returned to a lake. Later 40 fish are caught and 4 of them are marked. Estimate the number of fish in the lake. **[4 marks]**

Answer _____

2 30 fish are caught, marked and returned to a lake. Later 100 fish are caught and 10 of them are marked. Estimate the number of fish in the lake. **[4 marks]**

Answer _____

3 30 fish are caught, marked and returned to a lake. Later 40 fish are caught and 5 of them are marked. Estimate the number of fish in the lake. **[4 marks]**

Answer _____

4 20 fish are caught, marked and returned to a lake. Later 40 fish are caught and 5 of them are marked. Estimate the number of fish in the lake. **[4 marks]**

Answer _____

5 60 fish are caught, marked and returned to a lake. Later 60 fish are caught and 5 of them are marked. Estimate the number of fish in the lake. **[4 marks]**

Answer _____

Core

6 20 deer are tagged. In a later sample of 60 deer, 8 are tagged. Estimate the total number of deer. **[4 marks]**

Answer _____

7 In a sample of 100 birds, 5 have rings. 40 birds in total had rings previously fitted. Estimate the total number of birds. **[4 marks]**

Answer _____

8 50 trout are marked. A later sample of 80 trout contains 4 marked fish. Estimate how many trout are in the pond. **[4 marks]**

Answer _____

9 A scientist marks 50 beetles. In a second sample of 80, 4 are marked. Estimate the population. **[4 marks]**

Answer _____

10 30 fish are caught, marked and returned to a lake. Later 100 fish are caught and 10 of them are marked. What proportion of the second sample was marked? Give your answer as a fraction in simplest form. **[3 marks]**

Answer _____

Stretch

11 50 fish are caught, marked and returned to a lake. Later 100 fish are caught and 5 of them are marked. Write down two assumptions made in this estimate. **[4 marks]**

Answer _____

12 40 fish are caught, marked and returned to a lake. Later 80 fish are caught and 10 of them are marked. Explain why the estimate might be too high. **[4 marks]**

Answer _____

13 30 fish are caught, marked and returned to a lake. Later 40 fish are caught and 4 of them are marked. Later a bigger sample of 80 fish has 8 marked. Does this change the estimate? **[4 marks]**

Answer _____

14 60 fish are caught, marked and returned to a lake. Later 80 fish are caught and 4 of them are marked. If the second sample had contained 8 marked fish, what would the new estimate be? **[4 marks]**

Answer _____

15 40 fish are caught, marked and returned to a lake. Later 100 fish are caught and 5 of them are marked. Why is it better to use a large second sample? **[3 marks]**

Answer _____

Challenge

16 40 animals are marked. In a sample of 100, 5 are marked. After the study 4 marked animals died. Estimate the unmarked population now. **[5 marks]**

Answer _____

17 The estimate of the population is 1000. 40 animals were marked. What proportion of the population was marked? **[4 marks]**

Answer _____

18 A pond has an estimated 200 fish. 15% are caught in a net. How many are caught? **[4 marks]**

Answer _____

19 A second estimate using the same method gives 500. Find the mean of the two estimates. **[4 marks]**

Answer _____

20 50 animals are marked and the estimate of the population is 250. In another study, 80 animals are caught and the same proportion are marked. How many marked animals are expected? **[5 marks]**

Answer _____