

Name:

Exam Style Questions

Capture Recapture



Corbettmaths

Equipment needed: Calculator, pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 391



Answers and Video Solutions



1. John wants to estimate the number of fish in a pond.
He catches and tags 80 fish.
He returns the 80 fish to the pond.



The next day John catches 250 fish.
Of these 250 fish, 16 were tagged.

Work out an estimate for the total number of fish in the pond.

$$\frac{80}{N} = \frac{16}{250}$$

$$16N = 20000$$

$$N = 1250$$

1250

(3)

2. Luca wants to estimate the number of conkers in a bucket.



He marks 30 of the conkers and places them back in the bucket.
After mixing the conkers, Luca then picks 10 conkers at random.

Of the 10 conkers, 2 were marked.

Estimate the number of conkers in the bucket.

$$\frac{30}{N} = \frac{2}{10}$$

$$2N = 300$$

$$N = 150$$

150

(3)

3. A group of scientists want to estimate the number of eels in a lake.



They catch and ring 800 eels.
They return the 800 eels to the lake.

The next day they catch 700 eels.
Of these, 16 are ringed.

Estimate the number of eels in the lake.

$$\frac{800}{N} = \frac{16}{700}$$

$$16N = 560000$$

$$N = 35000$$

35000

.....
(3)

4. Isabella wants to estimate the number of snakes on an island.



On Thursday, she catches and tags 170 snakes.
These snakes are then released.

On Sunday, Isabella catches 240 snakes.
15 of these snakes have been tagged.

(a) Work out an estimate for the total number of snakes on the island.

$$\frac{170}{N} = \frac{15}{240}$$

$$15N = 40800$$

$$N = 2720$$

$$\begin{array}{r} 2720 \\ \hline \end{array} \quad (3)$$

(b) Explain one assumption that you have made in part (a).

No tags fell off.

.....

.....

.....

(1)

5. Victoria wants to estimate the squirrels that live in a wood.



On Wednesday she catches 24 of the squirrels.
She tagged each of them and returned them to the wood.

On Thursday she catches 40 of the squirrels.
She finds that 11 have been tagged.

Work out an estimate for the total number of squirrels in the wood.

$$\frac{24}{N} = \frac{11}{40}$$

$$11N = 960$$

$$N = 87.2727 \dots$$

87 or 88

87

.....
(3)

6. Ivan wants to work out an estimate for the number of fish living in a pond.



He captures x fish and tags them.
Ivan returns the fish to the pond.

The next day, Ivan catches 200 fish.
Of these 200 fish, 9 are tagged.

Ivan's estimate for the number of fish in the pond is 1200.

Work out how many fish Ivan tagged, x .

$$\frac{x}{1200} = \frac{9}{200}$$

$$200x = 10800$$

$$x = 54$$

54

.....
(3)

7. Hattie wants to estimate the number of honey bees in a beehive.



On Monday, Hattie caught 840 honey bees.
She marked each of them and then returned them to the beehive.

On Tuesday, Hattie caught 300 honey bees and noted how many were marked.

Hattie then calculates her estimate as 9000 honey bees in the beehive.

How many of the 300 honey bees caught on Tuesday were marked?

$$\frac{840}{9000} = \frac{m}{300}$$

$$9000m = 252000$$

$$m = 28$$

28

.....
(3)

8. Chloe wants to estimate how many woodlice live in a greenhouse.



On Saturday she caught 90 woodlice.
She puts a mark on each of them and returns them to the greenhouse.

On Sunday, Chloe caught a number of woodlice, y .
12 of these woodlice have been marked.

Chloe's estimate for the number of woodlice in the greenhouse is 600.

Work out how many woodlice Chloe caught on Sunday, y .

$$\frac{90}{600} = \frac{12}{y}$$

$$90y = 7200$$

$$y = 80$$

80
.....
(3)

10. A scientist wants to estimate the number of foxes living in a region.



On Monday, she locates and tags some foxes. x

On Tuesday, she returns and locates $x+10$ 10 more foxes than she had on Monday. She notices that 5 of the foxes are tagged.

The scientist works out an estimate for the total number of foxes living in the region.

She notices that the number of foxes that she had tagged on Monday was an eighth of her estimate for the total number of foxes in the region.

Work out how many foxes live in the region.

$$\frac{x}{8x} = \frac{5}{x+10}$$

$$x(x+10) = 40x$$

$$x^2 + 10x = 40x$$

$$x^2 - 30x = 0$$

$$x(x-30) = 0$$

$$x = 0 \quad \text{or} \quad x = 30$$

\times \checkmark

$$8 \times 30$$

240

(6)