JP Maths Revision

Attempt the paper before watching the solutions https://www.youtube.com/@JPMathsRevision

Higher Tier

Capture Recapture

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The marks for **each** question are shown in brackets- *use this as a guide as to how much time to spend on each question.*

Advice

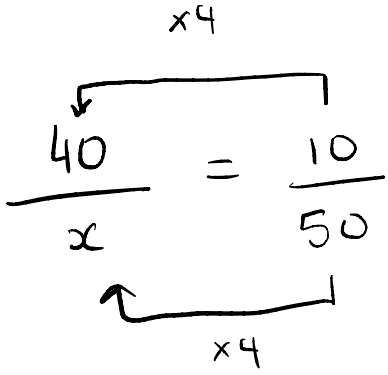
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

1. A pond contains an unknown number of fish.

40 fish are caught, tagged, and released.

Later, 50 fish are caught.10 of these are tagged.

Estimate the total number of fish in the pond.



50×4
=200

200

(Total for Question 1 is 3 marks)

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2. A wildlife researcher is estimating the number of squirrels in a park.

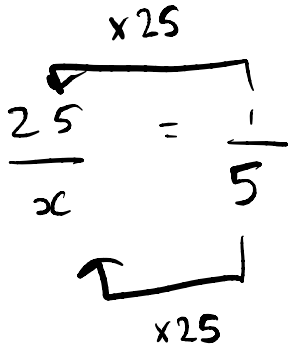
25 squirrels are caught, tagged, and released.

Later, 30 squirrels are caught.

6 of them are tagged.

Estimate the number of squirrels in the park.

$\frac{25}{x} = \frac{6}{30}$



$x = 5 \times 25$

$= 125$

125

(Total for Question 2 is 3 marks)

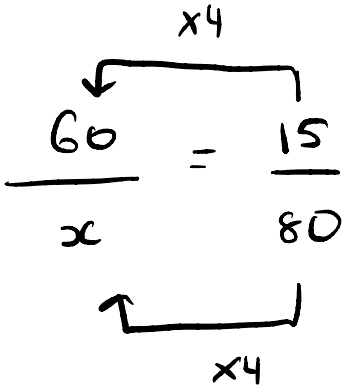
3. A teacher wants to estimate how many students use the school library.

60 students are given a sticker on Monday.

On Tuesday, 80 students enter the library.

15 of them have a sticker.

Estimate the total number of students who use the library.



$x = 80 \times 4$

$= 320$

320

(Total for Question 3 is 3 marks)

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4. A scientist is studying beetles.

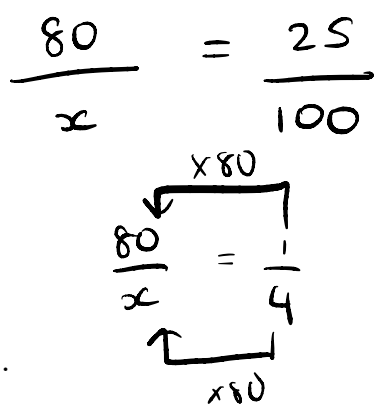
80 beetles are caught, marked, and released.

Later, 100 beetles are caught and 25 are marked.

(a) Estimate the total number of beetles.

$x = 4 \times 80$

$= 320$



320

(3)

(b) Give one assumption made.

None of the marks fall off

(1)

(Total for Question 4 is 4 marks)

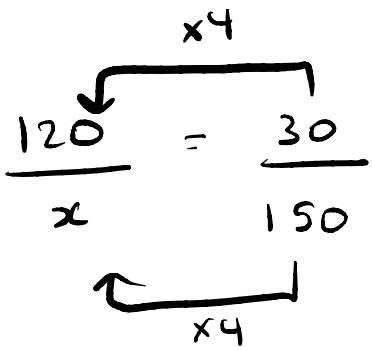
5. A researcher is estimating the number of birds on an island.

120 birds are tagged and released.

Later, 150 birds are captured.

30 of these are tagged.

(a) Estimate the total number of birds.



$x = 150 \times 4$

$= 600$

600

(3)

(b) The researcher repeats the experiment and gets a very different estimate.

Give one reason why the estimate might not be accurate.

The tags may have fallen off.

(1)

(Total for Question 5 is 4 marks)