Recurring Decimals

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Write 0.4 fraction.

Step 1 · Let x = 0.444…

One digit repeats, so multiply by 10

Step 2 · 10x = 4.444…

Same tail

Step 3 · Subtract: 10x – x

9x = 4

Answer: x = 4/9

Check: 4 ÷ 9 = 0.444… ✓

2. Now try one with the steps

Write 0.36 fraction in its simplest form.

Step 1 · Let x = 0.363636…

Step 2 · 100x = 36.363636…

Step 3 · Divide and simplify by 9

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Write 5/9 decimal, using dot notation. [1]

2. Write 0.7 fraction. [2]

3. Write 0.18 fraction in its simplest form. [2]

4. Write 0.45 fraction in its simplest form. [2]

5. Write 0.123 fraction in its simplest form. [3]

6. Write 0.16 (0.1666…) fraction in its simplest form. [3]

7. Write 0.83 (0.8333…) fraction in its simplest form. [3]

8. Write 0.07 (0.0777…) fraction. [3]

9. Write 0.318 (0.31818…) fraction in its simplest form. [3]

10. Write 2.4 improper fraction. [2]

11. Write 3/11 recurring decimal. [2]

12. Write 7/12 recurring decimal. [2]

13. Work out 0.1̇ + 0.2. Give your answer fraction in its simplest form. [2]

14. Work out 0.4 × 0.6. Give your answer fraction in its simplest form. [3]

15. Prove algebraically that 0.9 = 1. [2]

4. Before you hand it in

0.36̇: 10x = 3.6363... so 9x = 3.27...
The multiplier must shift the decimal by a WHOLE block. Two repeating digits → 100x. Then 100x − x = 36 exactly.

0.27̇: 100x − x = 27.5 so x = 27.5/99
x = 0.2777… has a 2 before the repeat. Use 100x and 10x, which both end …777…, so the difference is exactly 25.

Reading 0.27 as 0.2777...
Dots over BOTH 2 and 7 mean the block '27' repeats: 0.2727…. A single dot over the 7 (0.27) means only the 7 repeats.

Leaving the answer as 36/99
Questions usually say 'simplest form'. Divide top and bottom by their HCF: 36/99 = 4/11.