

Recurring decimals as exact fractions

Pearson Edexcel GCSE Mathematics 1MA1 • L009

Higher-only content • 10-minute alternative route • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs.

Discover through a worked example

Let $x=0.272727\dots$ with 27 repeating forever. Multiplying by 100 shifts one full repeating block: $100x=27.272727\dots$. Subtract x : $99x=27$ because the repeating tails cancel exactly. Therefore $x=27/99=3/11$. Multiplying by 100 is chosen because the block has two digits. This uses exact infinite repetition, not a rounded display.

H1

Let $x=0.666\dots$ with 6 repeating. Complete $10x=6.666\dots$; $10x-x=$ __; $9x=$ __; $x=$ __.

Optional scaffold: One repeating digit means multiply by 10.

H2

Use the model to convert $0.454545\dots$ (45 repeating) to an exact fraction. State the multiplier.

Optional scaffold: Align the repeating tails before subtracting.

Apply and prove independently

Four marks. Show working. Your teacher reviews the reasoning; these answers are not automatically marked.

HX1

Convert $0.777\ldots$ (7 repeating) to an exact fraction, showing the subtraction step. [2]

HX2

Convert $0.363636\ldots$ (36 repeating) to an exact fraction, showing the subtraction step. [2]

Next step

Record which step needs practice. Retry a fresh example after a delay. A completed task does not establish mastery.