

1.2 Fractions, decimals and recurring conversions

Name: _____ Class: _____ Date: _____

Total: 16 marks

KEY WORDS recurring decimal

Fractions, decimals and recurring conversions

Objective

Use equivalent fractions, mixed numbers and common denominators; multiply and divide fractions; convert between fractions, decimals and percentages including recurring decimals by algebra (objectives Foundation 1.2 A–H, 1.3 A–E and Higher 1.3 A).

1 Key knowledge and worked examples

Fraction work. Cancel or extend for equivalent fractions; common denominators to order, add and subtract ($\frac{1}{3} + \frac{1}{4} = \frac{7}{12}$); a fraction of a quantity multiplies ($\frac{3}{4}$ of 48 = 36); dividing multiplies by the reciprocal.

Conversions. Fraction to decimal: divide ($\frac{3}{8} = 0.375$); decimal to percentage: $\times 100$. Recurring decimals (Higher) convert by algebra: for $x = 0.777\dots$, $10x = 7.777\dots$ so $9x = 7$ and $x = \frac{7}{9}$.

2 Practice

2.1 Simplify $\frac{8}{12}$ [1]

2.2 Work out $\frac{1}{3} + \frac{1}{4}$ [2]

2.3 Work out $\frac{2}{5} \div 4$ [2]

2.4 Express 7 as a fraction of 28 [1]

2.5 Convert 0.375 to a fraction in its simplest form [2]

3 Exam-style questions

3.1 (*Edexcel 4MA1 2HR June 2024 Q18, adapted.*) Using algebra, convert the recurring decimal $0.306306\ldots$ to a fraction in its simplest form. [2]

3.2 (*Original.*) Work out $2\frac{1}{3} + 1\frac{3}{4}$, giving a mixed number. [3]

3.3 (*Original.*) A tank holds 240 litres; $\frac{3}{8}$ has drained. How much water remains? [3]

Solutions

2.1 $\frac{2}{3}$.

2.2 $\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$.

2.3 $\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$.

2.4 $\frac{7}{28} = \frac{1}{4}$.

2.5 $\frac{375}{1000} = \frac{3}{8}$.

3.1 Let $x = 0.306306\dots$. Then $1000x = 306.306\dots$, and subtracting, $999x = 306$, so $x = \frac{306}{999} = \frac{34}{111}$.

3.2 $\frac{7}{3} + \frac{7}{4} = \frac{28}{12} + \frac{21}{12} = \frac{49}{12} = 4\frac{1}{12}$.

3.3 Drained: $\frac{3}{8} \times 240 = 90$ litres; remaining $240 - 90 = 150$ litres.

Local review guidance: common denominators before adding; simplest forms; recurring-decimal proofs show both multiplied equations and the subtraction. This is authored classroom guidance.