Recurring Decimals: exam questions

10 questions · 25 marks · mark schemes at the end

Name _____ Date _____ Score / 25

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/recurring-decimals

1. **2 marks**

Prove algebraically that $0.\dot{4}\dot{5} = \frac{5}{11}$.

2. **3 marks**

Write $0.2\dot{7}$ as a fraction in its simplest form.

3. **2 marks**

Write $0.\dot{1}2\dot{3}$ as a fraction in its simplest form.

4. **2 marks**

Write $1.\dot{3}\dot{6}$ as a mixed number in its simplest form.

5. **3 marks**

Write $0.3\dot{1}\dot{5}$ as a fraction in its simplest form.

6. **2 marks**

(a) Write $\frac{7}{40}$ as a decimal. **(1)**

(b) Explain why $\frac{5}{12}$ is a recurring decimal. **(1)**

7. **3 marks**

(a) Write $\frac{3}{11}$ as a recurring decimal. **(1)**

(b) Hence, or otherwise, write $0.\dot{2}\dot{7} + 0.\dot{7}\dot{2}$ as a whole number. **(2)**

8. **2 marks**

Write $0.0\dot{6}$ as a fraction in its simplest form.

9. **3 marks**

Work out $0.\dot{4} + 0.\dot{2}\dot{3}$. Give your answer as a fraction.

10. **3 marks**

Show that $0.1\dot{3}\dot{6} = \dfrac{3}{22}$.

Answers and worked solutions

Question 1 — 2 marks

M1 $x = 0.4545\ldots$ and $100x = 45.4545\ldots$, so $99x = 45$

A1 $x = \dfrac{45}{99} = \dfrac{5}{11}$

Answer: shown

Question 2 — 3 marks

M1 $10x = 2.777\ldots$ and $100x = 27.777\ldots$

M1 $90x = 25$

A1 $\dfrac{5}{18}$

Answer: $\dfrac{5}{18}$

Question 3 — 2 marks

M1 $1000x - x = 123$, so $x = \dfrac{123}{999}$

A1 $\dfrac{41}{333}$

Answer: $\dfrac{41}{333}$

Question 4 — 2 marks

M1 $100x - x = 135$, or $0.\dot{3}\dot{6} = \dfrac{36}{99}$

A1 $1\frac{4}{11}$

Answer: $1\frac{4}{11}$

Question 5 — 3 marks

M1 $10x = 3.1515\ldots$ and $1000x = 315.1515\ldots$

M1 $990x = 312$

A1 $\dfrac{312}{990} = \dfrac{52}{165}$

Answer: $\dfrac{52}{165}$

Question 6 — 2 marks

(a)

B1 0.175

(b)

B1 $12 = 2^2 \times 3$: the denominator has a prime factor other than 2 or 5

Answer: (a) 0.175; (b) 12 has a prime factor 3

Question 7 — 3 marks

(a)

B1 $0.\dot{2}\dot{7}$

(b)

M1 $\dfrac{27}{99} + \dfrac{72}{99}$

A1 $\dfrac{99}{99} = 1$

Answer: (a) $0.\dot{2}\dot{7}$; (b) 1

Question 8 — 2 marks

M1 $10x = 0.666\ldots$ and $100x = 6.666\ldots$, so $90x = 6$

A1 $\dfrac{1}{15}$

Answer: $\dfrac{1}{15}$

Question 9 — 3 marks

M1 $0.\dot{4} = \dfrac{4}{9}$ or $0.\dot{2}\dot{3} = \dfrac{23}{99}$

M1 $\dfrac{44}{99} + \dfrac{23}{99}$

A1 $\dfrac{67}{99}$

Answer: $\dfrac{67}{99}$

Question 10 — 3 marks

M1 $10x = 1.3636\ldots$ and $1000x = 136.3636\ldots$

M1 $990x = 135$

A1 $\dfrac{135}{990} = \dfrac{3}{22}$ shown

Answer: shown

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/recurring-decimals
Our own original questions, written and checked by IGCSE Math Revision. Independent, not affiliated with Pearson Edexcel.