HIGHER

6.1 Recurring Decimals to Fractions: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write 0.8888... (8 recurring) as a fraction in its simplest form.

(Total for Question 1 is 2 marks)

2 Convert 5/12 to a decimal, stating clearly which digit(s) recur.

(Total for Question 2 is 2 marks)

3 Show that 0.6666... (6 recurring) = 2/3.

(Total for Question 3 is 3 marks)

4 Aisha compares the price of ribbon at two shops. Shop A sells ribbon at 5/£11 per metre. Shop B sells the same ribbon at exactly £0.45 per metre. Work out which shop sells the ribbon more cheaply per metre. Show your working.

(Total for Question 4 is 3 marks)

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5 Write these four numbers in order of size, starting with the smallest: 0.6, 0.6333... (3 recurring), 2/3, 0.65

(Total for Question 5 is 3 marks)

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6 Show that 0.909090... (90 recurring) = 10/11.

(Total for Question 6 is 3 marks)

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7 Write 0.444... (4 recurring) as a fraction. Hence work out 0.444... + 1/15 as a single fraction in its simplest form.

(Total for Question 7 is 4 marks)

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8 The recurring decimal 0.4d4d4d... (where the two-digit block 4d recurs, and d is a single digit) is equal to 46/99. Find the value of d.

(Total for Question 8 is 3 marks)

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Mark scheme · 6.1 Recurring Decimals to Fractions: 30-minute Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

8/9 seen	**M1**
8/9 cao (already in simplest form)	**A1**

Answer: 8/9

Question 2

0.41666... seen (or awrt 0.4167)	**B1**
correctly states that only the digit 6 recurs (not the 4 or the first 1), oe	**B1**

Answer: 0.41666... ; the digit 6 recurs (the 4 and the first 1 do not)

Question 3

x = 0.6666... and 10x = 6.6666... written	**M1**
subtracts to get 9x = 6, dependent on M1	**dM1**
cso, x = 2/3 with full method shown (6/9 simplified)	**A1**

Answer: 2/3 (shown)

Question 4

converts 5/11 to 0.454545... (or awrt 0.4545)	**M1**
correctly compares 0.454545... with 0.45, e.g. 0.4545... > 0.45	**A1**
clearly communicates the conclusion that Shop B is cheaper, with correct reference to both prices	**C1**

Answer: Shop B is cheaper (£0.45 per metre, compared with 5/11 = 0.4545... pounds per metre)

Question 5

converts 2/3 to 0.6666... (or awrt 0.667) so all four values are comparable	**M1**
correctly compares all four values	**M1**
correct order: 0.6, 0.6333..., 0.65, 2/3	**A1**

Answer: 0.6, 0.6333..., 0.65, 2/3

Question 6

x = 0.909090... and 100x = 90.9090... written (or equivalent)	**M1**
subtracts to get 99x = 90, dependent on M1	**M1**
cso, x = 10/11 with full algebraic method shown	**A1**

Answer: 10/11 (shown)

Question 7

10x - x = 4 or equivalent method	**M1**
4/9 cao	**A1**
common denominator used: 4/9 + 1/15	**M1**
23/45 cao	**A1**

Answer: 23/45

Question 8

recognises that 0.4d4d4d... = (40 + d)/99, from a valid algebraic method (e.g. x = 0.4d4d..., 100x = (4d).4d4d..., 99x = 40 + d)	**M1**
sets 40 + d = 46, dependent on M1	**dM1**
d = 6 cao	**A1**

Answer: d = 6

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