HIGHER

6.1 Recurring Decimals to Fractions: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Using the pattern for two-digit recurring blocks, write 0.909090... (90 recurring) as a fraction. Give your answer in its simplest form.

(Total for Question 1 is 2 marks)

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2 Convert 0.1111... (1 recurring) to a fraction in its simplest form.

(Total for Question 2 is 2 marks)

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3 Show that 0.363636... (36 recurring) = 4/11.

(Total for Question 3 is 3 marks)

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4 Convert 0.245245245... (245 recurring) to a fraction, giving your answer in its simplest form.

(Total for Question 4 is 3 marks)

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5 Write 3.919191... (91 recurring) as a fraction in its simplest form.

(Total for Question 5 is 3 marks)

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6 Write 10/11 as a recurring decimal.

(Total for Question 6 is 2 marks)

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7 Write 0.5656565... (65 recurring) as a fraction in its simplest form.

(Total for Question 7 is 4 marks)

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8 Write 9/22 as a recurring decimal.

(Total for Question 8 is 2 marks)

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9 Write 2.555... (5 recurring) as a fraction in its simplest form.

(Total for Question 9 is 2 marks)

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10 Show that 0.737373... (73 recurring) = 73/99.

(Total for Question 10 is 3 marks)

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11 Write 2/15 as a recurring decimal.

(Total for Question 11 is 2 marks)

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12 Write 0.6555... (5 recurring) as a fraction in its simplest form.

(Total for Question 12 is 4 marks)

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13 Show that 0.525252... (52 recurring) = 52/99.

(Total for Question 13 is 3 marks)

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14 Write 0.333... (3 recurring) as a fraction. Hence work out 0.333... + 2/15 as a single fraction in its simplest form.

(Total for Question 14 is 4 marks)

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15 Deepa compares the price of loose rice at two market stalls. Stall A sells rice at 4/£9 per kilogram. Stall B sells the same rice at exactly £0.40 per kilogram. Work out which stall sells the rice more cheaply per kilogram. Show your working.

(Total for Question 15 is 3 marks)

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16 Tomasz is converting 0.324324324... (324 recurring) to a fraction. His working is shown below.

Line 1: x = 0.324324324...

Line 2: 1000x = 324.324324...

Line 3: 999x = 324

Line 4: x = 324/999 = 108/333 (dividing numerator and denominator by 3)

Tomasz says 108/333 is the fraction in its simplest form. Explain why he is wrong, and give the fraction in its simplest form.

(Total for Question 16 is 3 marks)

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Mark scheme · 6.1 Recurring Decimals to Fractions: 1-hour Pack

Question 1

90/99 stated, using the two-digit recurring-block pattern	**M1**
10/11 cao, fully simplified	**A1**

Answer: 10/11

Question 2

x = 0.1111... and 10x = 1.1111... written (or equivalent valid method)	**M1**
1/9 cao	**A1**

Answer: 1/9

Question 3

x = 0.363636... and 100x = 36.363636... written	**M1**
subtracts to get 99x = 36, dependent on M1	**dM1**
cso, x = 4/11 with full algebraic method shown (36/99 simplified)	**A1**

Answer: 4/11 (shown)

Question 4

x = 0.245245245... and 1000x = 245.245245... written	**M1**
subtracts to get 999x = 245, dependent on M1	**dM1**
245/999 cao (already in simplest form, as 245 and 999 share no common factor)	**A1**

Answer: 245/999

Question 5

x = 3.919191... and 100x = ... written (or equivalent)	**M1**
subtracts to get 99x = 388 oe	**M1**
388/99 cao	**A1**

Answer: 388/99

Question 6

10 divided by 11 by division or equivalent method	**M1**
0.909090... (90 recurring)	**A1**

Answer: 0.909090... (90 recurring)

Question 7

10x and 1000x written with the same recurring part	**M1**
subtracts: 990x = 560 oe	**M1**
x = 560/990 oe	**M1**
56/99 cao	**A1**

Answer: 56/99

Question 8

9 divided by 22 by division or equivalent method	**M1**
0.4090909... (09 recurring)	**A1**

Answer: 0.4090909... (09 recurring)

Question 9

x = 2.555... and 10x = ... written, then subtracted to get 9x = 23	**M1**
23/9 cao	**A1**

Answer: 23/9

Question 10

x = 0.737373... and 100x = 73.7373... written (or equivalent)	**M1**
subtracts to get 99x = 73, dependent on M1	**M1**
cso, x = 73/99 with full algebraic method shown	**A1**

Answer: 73/99 (shown)

Question 11

2 divided by 15 by division or equivalent method	**M1**
0.1333... (3 recurring)	**A1**

Answer: 0.1333... (3 recurring)

Question 12

10x and 100x written with the same recurring part	**M1**
subtracts: 90x = 59 oe	**M1**
x = 59/90 oe	**M1**
59/90 cao	**A1**

Answer: 59/90

Question 13

x = 0.525252... and 100x = 52.5252... written (or equivalent)	**M1**
subtracts to get 99x = 52, dependent on M1	**M1**
cso, x = 52/99 with full algebraic method shown	**A1**

Answer: 52/99 (shown)

Question 14

10x - x = 3 or equivalent method	**M1**
1/3 cao	**A1**
common denominator used: 1/3 + 2/15	**M1**
7/15 cao	**A1**

Answer: 7/15

Question 15

converts 4/9 to 0.4444... (or awrt 0.4444)	**M1**
correctly compares 0.4444... with 0.4, e.g. 0.4444... > 0.4	**A1**
clearly communicates the conclusion that Stall B is cheaper, with correct reference to both prices	**C1**

Answer: Stall B is cheaper (£0.40 per kg, compared with 4/9 = 0.4444... pounds per kg at Stall A)

Question 16

identifies that 108/333 still shares a common factor (9), so is not yet in its simplest form, oe	**B1**
divides both 108 and 333 by 9 (or equivalent full simplification of 324/999)	**M1**
12/37 cao	**A1**

Answer: 12/37

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