EXPRESSWALA ACADEMY

Decimals and Irrational Numbers

Question Paper, Set 02

Time: 1 hour 30 minutes | Maximum marks: 50

Name: _____ Class: _____ Date: _____

1. Answer all 20 questions. The marks for each question are shown in brackets.
2. Show your working for the 2, 3 and 5 mark questions.
3. The key sheet and worked solutions are at the end of this paper.

1. Express $\frac{59}{1000}$ in decimal form. [1 mark]

2. Find the value of $\frac{3.08}{1000}$. [1 mark]

3. Find the value of 0.0526×100. [1 mark]

4. Write 0070.0200 without the unnecessary zeros. [1 mark]

5. Write the expanded form of 834.926. [2 marks]

6. Find the place value of 5 in 1584.629. [1 mark]

7. Without actual division, write $\frac{11}{8}$ in decimal form. [2 marks]

8. Using the division method, write $\frac{27}{8}$ as a decimal. [3 marks]

9. Without dividing, say whether $\frac{7}{30}$ will be a terminating decimal or a non-terminating repeated decimal. [1 mark]

10. Write $\frac{7}{22}$ in decimal form using the bar notation. [3 marks]

11. Write 0.075 in the form $\frac{p}{q}$ (simplest form). [2 marks]

12. Express $0.\overline{48}$ in the form $\frac{p}{q}$. [3 marks]

13. Express $1.2\overline{45}$ in the form $\frac{p}{q}$ (simplest form). Use the 'let x' method and check by the short method. [5 marks]

14. Find the sum: $4.087 + 26.35 + 7.6$ [2 marks]

15. Simplify: $1528.4 - 263.057 + 41.93 - 118.6$ [5 marks]

16. Multiply: 0.07×0.006 [2 marks]

17. Divide: $0.0963 \div 3$ [2 marks]

18. Find the value of $\frac{0.072}{0.009}$. [3 marks]

19. Find the value of $\frac{0.2}{0.04} + \frac{0.04}{0.2} - 0.15 \times 4$. [5 marks]

20. Two decimals multiply to give 15.9795. One of them is 2.65. Find the other. [5 marks]

Key sheet

Q	Answer
1	0.059
2	0.00308
3	5.26
4	70.02
5	$800 + 30 + 4 + \frac{9}{10} + \frac{2}{100} + \frac{6}{1000}$
6	500
7	1.375
8	3.375
9	Non-terminating recurring decimal
10	$0.3\overline{18}$
11	$\frac{3}{40}$
12	$\frac{16}{33}$
13	$\frac{137}{110}$
14	38.037
15	1188.673
16	0.00042
17	0.0321
18	8
19	4.6
20	6.03

Solutions

1. Express $\frac{59}{1000}$ in decimal form. [1]

1000 has 3 zeros, so move the decimal point 3 places to the left in 59.

Write zeros in front to fill the empty places.

$\frac{59}{1000} = 0.059$

Ans: 0.059

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2. Find the value of $\frac{3.08}{1000}$. [1]

Dividing by 1000 moves the decimal point 3 places to the left (put zeros in front where needed).

$\frac{3.08}{1000} = 0.00308$

Ans: 0.00308

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3. Find the value of 0.0526×100. [1]

Multiplying by 100 moves the decimal point 2 places to the right (fill zeros if needed).

$0.0526 \times 100 = 5.26$

Ans: 5.26

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4. Write 0070.0200 without the unnecessary zeros. [1]

Zeros in front of the whole number part and zeros at the end of the decimal part do not change the value.

Zeros in the middle must stay.

$0070.0200 = 70.02$

Ans: 70.02

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5. Write the expanded form of 834.926. [2]

Place values: $8 \to 800$, $3 \to 30$, $4 \to 4$, $9 \to \frac{9}{10}$, $2 \to \frac{2}{100}$, $6 \to \frac{6}{1000}$

$834.926 = 800 + 30 + 4 + \frac{9}{10} + \frac{2}{100} + \frac{6}{1000}$

Ans: $800 + 30 + 4 + \frac{9}{10} + \frac{2}{100} + \frac{6}{1000}$

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6. Find the place value of 5 in 1584.629. [1]

In 1584.629, the digit 5 is in the hundreds place.

$\text{Place value of } 5 = 500$

Ans: 500

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7. Without actual division, write $\frac{11}{8}$ in decimal form. [2]

1st method (without actual division)

$8 = 2 \times 2 \times 2$; pair each 2 with a 5 to make 10s.

$\frac{11}{8} = \frac{11 \times 5 \times 5 \times 5}{2 \times 2 \times 2 \times 5 \times 5 \times 5}$

$= \frac{1375}{10 \times 10 \times 10} = \frac{1375}{1000} = 1.375$

Ans: 1.375

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8. Using the division method, write $\frac{27}{8}$ as a decimal. [3]

2nd method (division method): divide 27 by 8.

$8 \times 3 = 24$, $27 - 24 = 3$

Bring down 0: 30; $8 \times 3 = 24$, $30 - 24 = 6$

Bring down 0: 60; $8 \times 7 = 56$, $60 - 56 = 4$

Bring down 0: 40; $8 \times 5 = 40$, $40 - 40 = 0$

Remainder 0. $\therefore \frac{27}{8} = 3.375$

Ans: 3.375

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9. Without dividing, say whether $\frac{7}{30}$ will be a terminating decimal or a non-terminating repeated decimal. [1]

$30 = 2 \times 3 \times 5$ has the factor 3 (not 2 or 5).

So it is a non-terminating recurring decimal.

Ans: Non-terminating recurring decimal

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10. Write $\frac{7}{22}$ in decimal form using the bar notation. [3]

Divide 7 by 22.

$7 < 22$, so write $0.$ and bring down a 0

Bring down 0: 70; $22 \times 3 = 66$, $70 - 66 = 4$

Bring down 0: 40; $22 \times 1 = 22$, $40 - 22 = 18$

Bring down 0: 180; $22 \times 8 = 176$, $180 - 176 = 4$

The remainder 4 has come again, so the digits 18 repeat.

$\therefore \frac{7}{22} = 0.3181818\ldots = 0.3\overline{18}$

Ans: $0.3\overline{18}$

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11. Write 0.075 in the form $\frac{p}{q}$ (simplest form). [2]

$0.075 = \frac{75}{1000}$ (3 digits after the point, so 1000)

Divide both by 25: $\frac{75 \div 25}{1000 \div 25} = \frac{3}{40}$

$\therefore 0.075 = \frac{3}{40}$

Ans: $\frac{3}{40}$

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12. Express $0.\overline{48}$ in the form $\frac{p}{q}$. [3]

Let $x = 0.\overline{48} = 0.484848\ldots$

$100x = 48.484848\ldots$

$x = 0.484848\ldots$

$(-)\ 99x = 48$

$x = \frac{48}{99} = \frac{16}{33}$

$\therefore 0.\overline{48} = \frac{16}{33}$

Ans: $\frac{16}{33}$

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13. Express $1.2\overline{45}$ in the form $\frac{p}{q}$ (simplest form). Use the 'let x' method and check by the short method. [5]

Let $x = 1.2\overline{45} = 1.2454545\ldots$

$10x = 12.454545\ldots$ (the repeating part starts just after the point)

$1000x = 1245.454545\ldots$

$10x = 12.454545\ldots$

$(-)\ 990x = 1233$

$x = \frac{1233}{990} = \frac{137}{110}$

Check (short method): $\frac{1245-12}{990} = \frac{1233}{990} = \frac{137}{110}$

$\therefore 1.2\overline{45} = \frac{137}{110}$

Ans: $\frac{137}{110}$

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14. Find the sum: $4.087 + 26.35 + 7.6$ [2]

Write the numbers one below the other with the decimal points in a line (fill zeros):

$$\begin{array}{r} 4.087 \\ 26.350 \\ +\ 7.600 \\ \hline 38.037 \end{array}$$

$\therefore 4.087 + 26.35 + 7.6 = 38.037$

Ans: 38.037

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15. Simplify: $1528.4 - 263.057 + 41.93 - 118.6$ [5]

Group the terms: $(1528.4 + 41.93) - (263.057 + 118.6)$

Positive terms:
$$\begin{array}{r} 1528.40 \\ +\ 41.93 \\ \hline 1570.33 \end{array}$$

Negative terms:
$$\begin{array}{r} 263.057 \\ +\ 118.600 \\ \hline 381.657 \end{array}$$

Subtract:
$$\begin{array}{r} 1570.330 \\ -\ 381.657 \\ \hline 1188.673 \end{array}$$

$\therefore 1528.4 - 263.057 + 41.93 - 118.6 = 1188.673$

Ans: 1188.673

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16. Multiply: 0.07×0.006 [2]

Multiply without the points: $7 \times 6 = 42$

Decimal places: $2 + 3 = 5$

$0.07 \times 0.006 = 0.00042$

Ans: 0.00042

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17. Divide: $0.0963 \div 3$ [2]

$\frac{0.0963}{3} = \frac{963}{10000 \times 3}$

$963 \div 3 = 321$

$= \frac{321}{10000} = 0.0321$

Ans: 0.0321

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18. Find the value of $\frac{0.072}{0.009}$. [3]

0.009 has 3 digits after the point, so multiply both by 1000:

$\frac{0.072}{0.009} = \frac{0.072 \times 1000}{0.009 \times 1000} = \frac{72}{9}$

$72 \div 9 = 8$

$\therefore 0.072 \div 0.009 = 8$

Ans: 8

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19. Find the value of $\frac{0.2}{0.04} + \frac{0.04}{0.2} - 0.15 \times 4$. [5]

$\frac{0.2}{0.04} = \frac{0.2 \times 100}{0.04 \times 100} = \frac{20}{4} = 5$

$\frac{0.04}{0.2} = \frac{0.04 \times 10}{0.2 \times 10} = \frac{0.4}{2} = 0.2$

$0.15 \times 4 = 0.60 = 0.6$

Value $= 5 + 0.2 - 0.6 = 4.6$

Ans: 4.6

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20. Two decimals multiply to give 15.9795. One of them is 2.65. Find the other. [5]

Let the other decimal be x. Then $x \times 2.65 = 15.9795$

$x = \frac{15.9795}{2.65} = \frac{15.9795 \times 100}{2.65 \times 100} = \frac{1597.95}{265}$

$\frac{1597.95}{265} = \frac{159795}{100 \times 265}$; divide 159795 by 265:

$265 \times 6 = 1590$, $1597 - 1590 = 7$

Bring down 9: $79 < 265$, write 0

Bring down 5: $265 \times 3 = 795$, $795 - 795 = 0$

$159795 \div 265 = 603$, so $x = \frac{603}{100} = 6.03$

Check: $6.03 \times 2.65 = 15.9795$

$\therefore$ the other decimal $= 6.03$

Ans: 6.03