EXPRESSWALA ACADEMY

Decimals and Irrational Numbers

Question Paper, Set 03

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. Write $\frac{2468}{100}$ in decimal form. [1 mark]

2. Write the value of $\frac{726.4}{10000}$. [1 mark]

3. Multiply: 12.8×10000 [1 mark]

4. Simplify 00.0300 by removing the zeros that do not change its value. [1 mark]

5. Write as a decimal: $500 + 60 + 1 + \frac{4}{10} + \frac{8}{100} + \frac{3}{1000}$ [2 marks]

6. Write the place value of 9 in 32.419. [1 mark]

7. Using the 1st method (without actual division), convert $\frac{9}{25}$ into a decimal. [2 marks]

8. Divide and write $\frac{7}{32}$ in decimal form. [3 marks]

9. Without actual division, state whether $\frac{9}{64}$ is a terminating decimal or a non-terminating recurring decimal. [1 mark]

10. Divide and express $\frac{11}{12}$ as a non-terminating recurring decimal. [3 marks]

11. Express 4.8 as a rational number in its simplest form. [2 marks]

12. Write $2.\overline{4}$ as a rational number in its simplest form. [3 marks]

13. Write $0.1\overline{5}$ as a rational number in its simplest form. Show the 'let x' working and check it by the short method. [5 marks]

14. Add 1526.4 and 384.075. [2 marks]

15. Evaluate $87.205 - 12.68 + 340.9 - 56.734$. [5 marks]

16. Find the product of 12.5 and 0.36. [2 marks]

17. Find the value of $\frac{15.75}{5}$. [2 marks]

18. Divide: $2.75 \div 0.25$ [3 marks]

19. Simplify: $\frac{0.5 \times 0.8}{0.02} - \frac{1.2}{0.3} + 0.25 \times 0.4$ [5 marks]

20. The product of two decimal numbers is 5.5512. One number is 5.14. What is the other number? [5 marks]

Key sheet

Q	Answer
1	24.68
2	0.07264
3	128000
4	0.03
5	561.483
6	$\frac{9}{1000}$
7	0.36
8	0.21875
9	Terminating decimal
10	$0.91\overline{6}$
11	$\frac{24}{5}$
12	$\frac{22}{9}$
13	$\frac{7}{45}$
14	1910.475
15	358.691
16	4.5
17	3.15
18	11
19	16.1
20	1.08

Solutions

1. Write $\frac{2468}{100}$ in decimal form. [1]

100 has 2 zeros, so move the decimal point 2 places to the left in 2468.

$\frac{2468}{100} = 24.68$

Ans: 24.68

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2. Write the value of $\frac{726.4}{10000}$. [1]

Dividing by 10000 moves the decimal point 4 places to the left (put zeros in front where needed).

$\frac{726.4}{10000} = 0.07264$

Ans: 0.07264

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3. Multiply: 12.8×10000 [1]

Multiplying by 10000 moves the decimal point 4 places to the right (fill zeros if needed).

$12.8 \times 10000 = 128000.0 = 128000$

Ans: 128000

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4. Simplify 00.0300 by removing the zeros that do not change its value. [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.

$00.0300 = 0.03$

Ans: 0.03

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5. Write as a decimal: $500 + 60 + 1 + \frac{4}{10} + \frac{8}{100} + \frac{3}{1000}$ [2]

Hundreds 5, tens 6, ones 1, tenths 4, hundredths 8, thousandths 3

Put 0 in any place that is missing.

$500 + 60 + 1 + \frac{4}{10} + \frac{8}{100} + \frac{3}{1000} = 561.483$

Ans: 561.483

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6. Write the place value of 9 in 32.419. [1]

In 32.419, the digit 9 is in the thousandths place.

$\text{Place value of } 9 = \frac{9}{1000}$

Ans: $\frac{9}{1000}$

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7. Using the 1st method (without actual division), convert $\frac{9}{25}$ into a decimal. [2]

1st method (without actual division)

$25 = 5 \times 5$; pair each 2 with a 5 to make 10s.

$\frac{9}{25} = \frac{9\times2\times2}{5\times5\times2\times2}$

$= \frac{36}{10\times10} = \frac{36}{100} = 0.36$

Ans: 0.36

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8. Divide and write $\frac{7}{32}$ in decimal form. [3]

2nd method (division method): divide 7 by 32.

$7 < 32$, so write $0.$ and bring down a 0

Bring down 0: 70; $32 \times 2 = 64$, $70 - 64 = 6$

Bring down 0: 60; $32 \times 1 = 32$, $60 - 32 = 28$

Bring down 0: 280; $32 \times 8 = 256$, $280 - 256 = 24$

Bring down 0: 240; $32 \times 7 = 224$, $240 - 224 = 16$

Bring down 0: 160; $32 \times 5 = 160$, $160 - 160 = 0$

Remainder 0. $\therefore \frac{7}{32} = 0.21875$

Ans: 0.21875

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9. Without actual division, state whether $\frac{9}{64}$ is a terminating decimal or a non-terminating recurring decimal. [1]

$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$ has only 2s and 5s.

So it is a terminating decimal.

Ans: Terminating decimal

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10. Divide and express $\frac{11}{12}$ as a non-terminating recurring decimal. [3]

Divide 11 by 12.

$11 < 12$, so write $0.$ and bring down a 0

Bring down 0: 110; $12 \times 9 = 108$, $110 - 108 = 2$

Bring down 0: 20; $12 \times 1 = 12$, $20 - 12 = 8$

Bring down 0: 80; $12 \times 6 = 72$, $80 - 72 = 8$

The remainder 8 has come again, so the digits 6 repeat.

$\therefore \frac{11}{12} = 0.91666666\ldots = 0.91\overline{6}$

Ans: $0.91\overline{6}$

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11. Express 4.8 as a rational number in its simplest form. [2]

$4.8 = \frac{48}{10}$ (1 digit after the point, so 10)

Divide both by 2: $\frac{48 \div 2}{10 \div 2} = \frac{24}{5}$

$\therefore 4.8 = \frac{24}{5}$

Ans: $\frac{24}{5}$

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12. Write $2.\overline{4}$ as a rational number in its simplest form. [3]

Let $x = 2.\overline{4} = 2.444444\ldots$

$10x = 24.444444\ldots$

$x = 2.444444\ldots$

$(-)\ 9x = 22$

$x = \frac{22}{9}$

$\therefore 2.\overline{4} = \frac{22}{9}$

Ans: $\frac{22}{9}$

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13. Write $0.1\overline{5}$ as a rational number in its simplest form. Show the 'let x' working and check it by the short method. [5]

Let $x = 0.1\overline{5} = 0.1555555\ldots$

$10x = 1.555555\ldots$ (the repeating part starts just after the point)

$100x = 15.555555\ldots$

$10x = 1.555555\ldots$

$(-)\ 90x = 14$

$x = \frac{14}{90} = \frac{7}{45}$

Check (short method): $\frac{15-1}{90} = \frac{14}{90} = \frac{7}{45}$

$\therefore 0.1\overline{5} = \frac{7}{45}$

Ans: $\frac{7}{45}$

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14. Add 1526.4 and 384.075. [2]

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

$$\begin{array}{r} 1526.400 \\ +\ 384.075 \\ \hline 1910.475 \end{array}$$

$\therefore 1526.4 + 384.075 = 1910.475$

Ans: 1910.475

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15. Evaluate $87.205 - 12.68 + 340.9 - 56.734$. [5]

Group the terms: $(87.205 + 340.9) - (12.68 + 56.734)$

Positive terms: $\begin{array}{r} 87.205 \\ +\ 340.900 \\ \hline 428.105 \end{array}$

Negative terms: $\begin{array}{r} 12.680 \\ +\ 56.734 \\ \hline 69.414 \end{array}$

Subtract: $\begin{array}{r} 428.105 \\ -\ 69.414 \\ \hline 358.691 \end{array}$

$\therefore 87.205 - 12.68 + 340.9 - 56.734 = 358.691$

Ans: 358.691

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16. Find the product of 12.5 and 0.36. [2]

Multiply without the points: $125 \times 36 = 4500$

Decimal places: $1 + 2 = 3$

$12.5 \times 0.36 = 4.500 = 4.5$

Ans: 4.5

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17. Find the value of $\frac{15.75}{5}$. [2]

$\frac{15.75}{5} = \frac{1575}{100 \times 5}$

$1575 \div 5 = 315$

$= \frac{315}{100} = 3.15$

Ans: 3.15

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18. Divide: $2.75 \div 0.25$ [3]

0.25 has 2 digits after the point, so multiply both by 100:

$\frac{2.75}{0.25} = \frac{2.75 \times 100}{0.25 \times 100} = \frac{275}{25}$

$275 \div 25 = 11$

$\therefore 2.75 \div 0.25 = 11$

Ans: 11

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19. Simplify: $\frac{0.5 \times 0.8}{0.02} - \frac{1.2}{0.3} + 0.25 \times 0.4$ [5]

$0.5 \times 0.8 = 0.40 = 0.4$

$\frac{0.4}{0.02} = \frac{0.4 \times 100}{0.02 \times 100} = \frac{40}{2} = 20$

$\frac{1.2}{0.3} = \frac{12}{3} = 4$

$0.25 \times 0.4 = 0.100 = 0.1$

Value $= 20 - 4 + 0.1 = 16.1$

Ans: 16.1

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20. The product of two decimal numbers is 5.5512. One number is 5.14. What is the other number? [5]

Let the other decimal be x. Then $x \times 5.14 = 5.5512$

$x = \frac{5.5512}{5.14} = \frac{5.5512 \times 100}{5.14 \times 100} = \frac{555.12}{514}$

$\frac{555.12}{514} = \frac{55512}{100 \times 514}$; divide 55512 by 514:

$514 \times 1 = 514$, $555 - 514 = 41$

Bring down 1: $411 < 514$, write 0

Bring down 2: $514 \times 8 = 4112$, $4112 - 4112 = 0$

$55512 \div 514 = 108$, so $x = \frac{108}{100} = 1.08$

Check: $1.08 \times 5.14 = 5.5512$

$\therefore$ the other decimal $= 1.08$

Ans: 1.08