

Decimals and Irrational Numbers

Question Paper, Set 09

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 $\frac{307}{100}$ in decimal form. [1 mark]
2. Write the value of $\frac{64.07}{100}$. [1 mark]
3. Multiply: 1.3×100000 [1 mark]
4. Simplify 003.0300 by removing the zeros that do not change its value. [1 mark]
5. Write as a decimal: $900 + 4 + \frac{2}{10} + \frac{7}{1000}$ [2 marks]
6. Write the place value of 7 in 418.567. [1 mark]
7. Using the 1st method (without actual division), convert $\frac{9}{80}$ into a decimal. [2 marks]
8. Divide and write $\frac{21}{125}$ in decimal form. [3 marks]
9. Without actual division, state whether $\frac{27}{250}$ is a terminating decimal or a non-terminating recurring decimal. [1 mark]
10. Express $1\frac{1}{6}$ in decimal form. [3 marks]
11. Express 0.336 as a rational number in its simplest form. [2 marks]
12. Write $0.\overline{63}$ as a rational number in its simplest form. [3 marks]
13. Write $0.21\overline{6}$ as a rational number in its simplest form. Show the 'let x ' working and check it by the short method. [5 marks]
14. Add 0.875 and 49.38. [2 marks]
15. Evaluate $406.2 - 59.837 + 1265.08 - 340.5$. [5 marks]
16. Find the product of 6.75 and 0.8. [2 marks]
17. Find the value of $\frac{3.648}{12}$. [2 marks]
18. Divide: $1.344 \div 0.32$ [3 marks]
19. Simplify: $\frac{0.36}{0.04} - \frac{0.6 \times 5}{10 \times 1.5} + 0.7 \times 0.3$ [5 marks]

- 20.** The product of two decimal numbers is 11.629. One number is 8.02. What is the other number? [5 marks]
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Key sheet

Q	Answer
1	3.07
2	0.6407
3	130000
4	3.03
5	904.207
6	$\frac{7}{1000}$
7	0.1125
8	0.168
9	Terminating decimal
10	$1.1\overline{6}$
11	$\frac{42}{125}$
12	$\frac{7}{11}$
13	$\frac{13}{60}$
14	50.255
15	1270.943
16	5.4
17	0.304
18	4.2
19	9.01
20	1.45

Solutions

1. Write $\frac{307}{100}$ in decimal form. [1]

100 has 2 zeros, so move the decimal point 2 places to the left in 307.

$$\frac{307}{100} = 3.07$$

Ans: 3.07

2. Write the value of $\frac{64.07}{100}$. [1]

Dividing by 100 moves the decimal point 2 places to the left (put zeros in front where needed).

$$\frac{64.07}{100} = 0.6407$$

Ans: 0.6407

3. Multiply: 1.3×100000 [1]

Multiplying by 100000 moves the decimal point 5 places to the right (fill zeros if needed).

$$1.3 \times 100000 = 130000.0 = 130000$$

Ans: 130000

4. Simplify 003.0300 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.

$$003.0300 = 3.03$$

Ans: 3.03

5. Write as a decimal: $900 + 4 + \frac{2}{10} + \frac{7}{1000}$ [2]

Hundreds 9, tens 0, ones 4, tenths 2, hundredths 0, thousandths 7

Put 0 in any place that is missing.

$$900 + 4 + \frac{2}{10} + \frac{7}{1000} = 904.207$$

Ans: 904.207

6. Write the place value of 7 in 418.567. [1]

In 418.567, the digit 7 is in the thousandths place.

$$\text{Place value of 7} = \frac{7}{1000}$$

Ans: $\frac{7}{1000}$

7. Using the 1st method (without actual division), convert $\frac{9}{80}$ into a decimal. [2]

1st method (without actual division)

$80 = 2 \times 2 \times 2 \times 2 \times 5$; pair each 2 with a 5 to make 10s.

$$\begin{aligned}\frac{9}{80} &= \frac{9 \times 5 \times 5 \times 5}{2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5} \\ &= \frac{1125}{10 \times 10 \times 10 \times 10} = \frac{1125}{10000} = 0.1125\end{aligned}$$

Ans: 0.1125

8. Divide and write $\frac{21}{125}$ in decimal form. [3]

2nd method (division method): divide 21 by 125.

$21 < 125$, so write 0. and bring down a 0

Bring down 0: 210; $125 \times 1 = 125$, $210 - 125 = 85$

Bring down 0: 850; $125 \times 6 = 750$, $850 - 750 = 100$

Bring down 0: 1000; $125 \times 8 = 1000$, $1000 - 1000 = 0$

Remainder 0. $\therefore \frac{21}{125} = 0.168$

Ans: 0.168

9. Without actual division, state whether $\frac{27}{250}$ is a terminating decimal or a non-terminating recurring decimal. [1]

$250 = 2 \times 5 \times 5 \times 5$ has only 2s and 5s.

So it is a terminating decimal.

Ans: Terminating decimal

10. Express $1\frac{1}{6}$ in decimal form. [3]

$1\frac{1}{6} = \frac{7}{6}$; divide 7 by 6.

$6 \times 1 = 6$, $7 - 6 = 1$

Bring down 0: 10; $6 \times 1 = 6$, $10 - 6 = 4$

Bring down 0: 40; $6 \times 6 = 36$, $40 - 36 = 4$

The remainder 4 has come again, so the digits 6 repeat.

$\therefore 1\frac{1}{6} = 1.1666666 \dots = 1.1\overline{6}$

Ans: $1.1\overline{6}$

11. Express 0.336 as a rational number in its simplest form. [2]

$0.336 = \frac{336}{1000}$ (3 digits after the point, so 1000)

Divide both by 8: $\frac{336 \div 8}{1000 \div 8} = \frac{42}{125}$

$\therefore 0.336 = \frac{42}{125}$

Ans: $\frac{42}{125}$

12. Write $0.\overline{63}$ as a rational number in its simplest form. [3]

Let $x = 0.\overline{63} = 0.636363 \dots$

$100x = 63.636363 \dots$

$x = 0.636363 \dots$

$(-) 99x = 63$

$x = \frac{63}{99} = \frac{7}{11}$

$\therefore 0.\overline{63} = \frac{7}{11}$

Ans: $\frac{7}{11}$

13. Write $0.21\overline{6}$ as a rational number in its simplest form. Show the 'let x ' working and check it by the short method. [5]

$$\text{Let } x = 0.21\overline{6} = 0.21666666 \dots$$

$$100x = 21.666666 \dots \text{ (the repeating part starts just after the point)}$$

$$1000x = 216.666666 \dots$$

$$100x = 21.666666 \dots$$

$$(-) 900x = 195$$

$$x = \frac{195}{900} = \frac{13}{60}$$

$$\text{Check (short method): } \frac{216-21}{900} = \frac{195}{900} = \frac{13}{60}$$

$$\therefore 0.21\overline{6} = \frac{13}{60}$$

$$\text{Ans: } \frac{13}{60}$$

14. Add 0.875 and 49.38. [2]

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

$$\begin{array}{r} 0.875 \\ + 49.380 \\ \hline 50.255 \end{array}$$

$$\therefore 0.875 + 49.38 = 50.255$$

$$\text{Ans: } 50.255$$

15. Evaluate $406.2 - 59.837 + 1265.08 - 340.5$. [5]

Group the terms: $(406.2 + 1265.08) - (59.837 + 340.5)$

$$\begin{array}{r} 406.20 \\ \text{Positive terms: } + 1265.08 \\ \hline 1671.28 \end{array}$$

$$\begin{array}{r} 59.837 \\ \text{Negative terms: } + 340.500 \\ \hline 400.337 \end{array}$$

$$\begin{array}{r} 1671.280 \\ \text{Subtract: } - 400.337 \\ \hline 1270.943 \end{array}$$

$$\therefore 406.2 - 59.837 + 1265.08 - 340.5 = 1270.943$$

$$\text{Ans: } 1270.943$$

16. Find the product of 6.75 and 0.8. [2]

Multiply without the points: $675 \times 8 = 5400$

Decimal places: $2 + 1 = 3$

$$6.75 \times 0.8 = 5.400 = 5.4$$

$$\text{Ans: } 5.4$$

17. Find the value of $\frac{3.648}{12}$. [2]

$$\frac{3.648}{12} = \frac{3648}{1000 \times 12}$$

$$3648 \div 12 = 304$$

$$= \frac{304}{1000} = 0.304$$

$$\text{Ans: } 0.304$$

18. Divide: $1.344 \div 0.32$ [3]

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

$$\frac{1.344}{0.32} = \frac{1.344 \times 100}{0.32 \times 100} = \frac{134.4}{32}$$

$$\frac{134.4}{32} = \frac{1344}{10 \times 32}$$

$$1344 \div 32 = 42$$

$$= \frac{42}{10} = 4.2$$

$$\therefore 1.344 \div 0.32 = 4.2$$

Ans: 4.2

19. Simplify: $\frac{0.36}{0.04} - \frac{0.6 \times 5}{10 \times 1.5} + 0.7 \times 0.3$ [5]

$$\frac{0.36}{0.04} = \frac{0.36 \times 100}{0.04 \times 100} = \frac{36}{4} = 9$$

$$\frac{0.6 \times 5}{10 \times 1.5} = \frac{3.0}{15.0} = \frac{3}{15} = 0.2$$

$$0.7 \times 0.3 = 0.21$$

$$\text{Value} = 9 - 0.2 + 0.21 = 9.01$$

Ans: 9.01

20. The product of two decimal numbers is 11.629. One number is 8.02. What is the other number? [5]

Let the other decimal be x . Then $x \times 8.02 = 11.629$

$$x = \frac{11.629}{8.02} = \frac{11.629 \times 100}{8.02 \times 100} = \frac{1162.9}{802}$$

$$\frac{1162.9}{802} = \frac{116290}{100 \times 802}; \text{ divide 116290 by 802:}$$

$$802 \times 1 = 802, 1162 - 802 = 360$$

$$\text{Bring down 9: } 802 \times 4 = 3208, 3609 - 3208 = 401$$

$$\text{Bring down 0: } 802 \times 5 = 4010, 4010 - 4010 = 0$$

$$116290 \div 802 = 145, \text{ so } x = \frac{145}{100} = 1.45$$

$$\text{Check: } 1.45 \times 8.02 = 11.629$$

$$\therefore \text{the other decimal} = 1.45$$

Ans: 1.45
