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CLASS – 9

MATHS

CHAPTER - 1

Number System

Part – 5

Exercise 1.3

Vikas Saini

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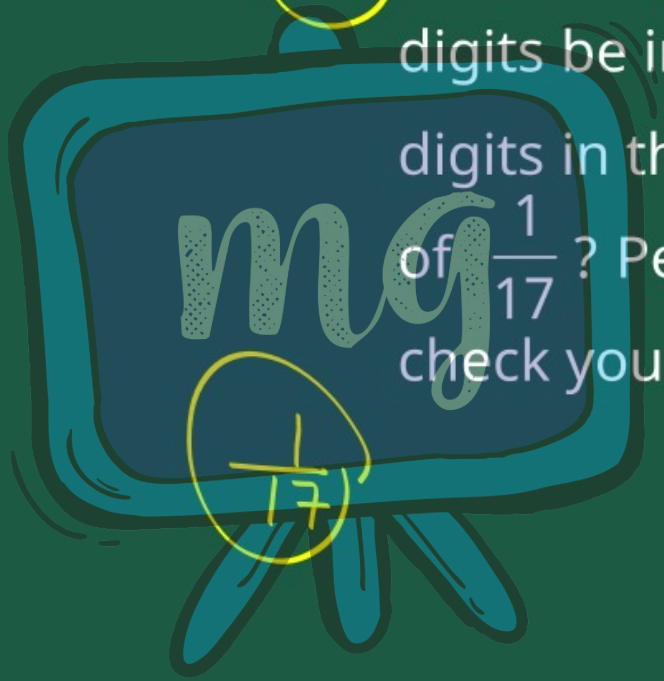
5. What can the maximum number of digits be in the repeating block of digits in the decimal expansion of $\frac{1}{17}$? Perform the division to check your answer.



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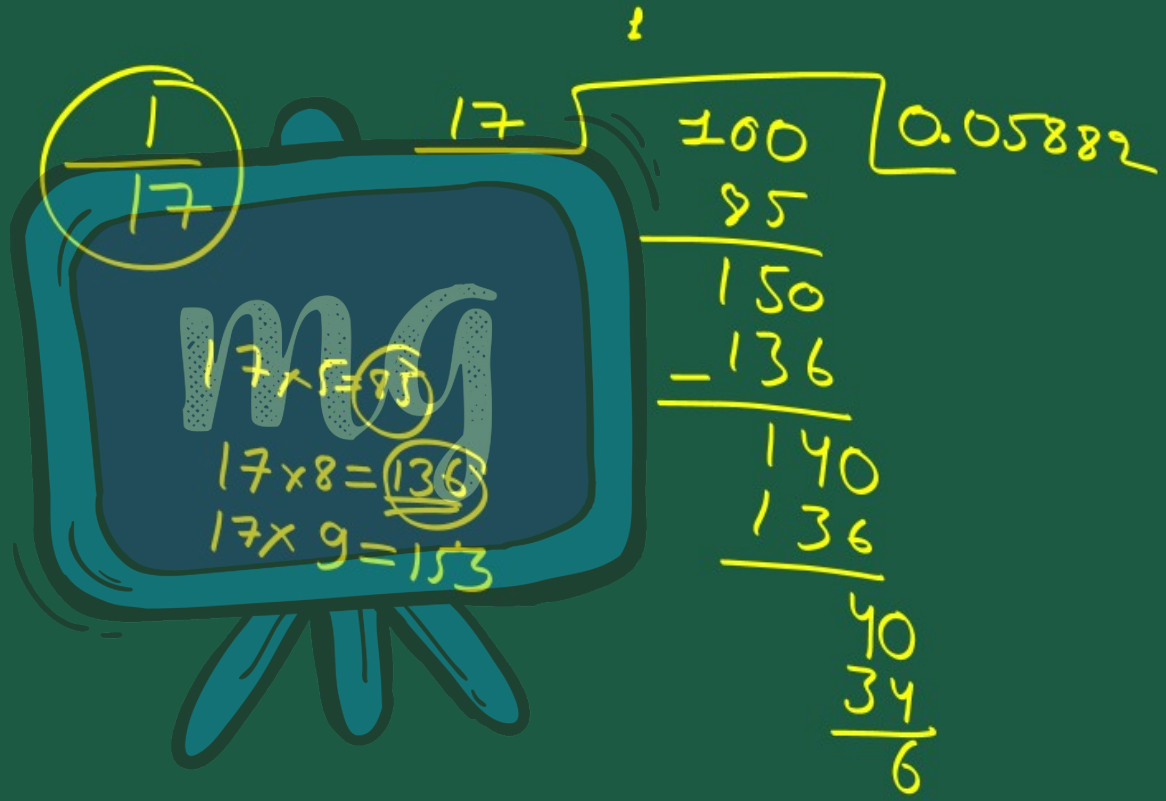

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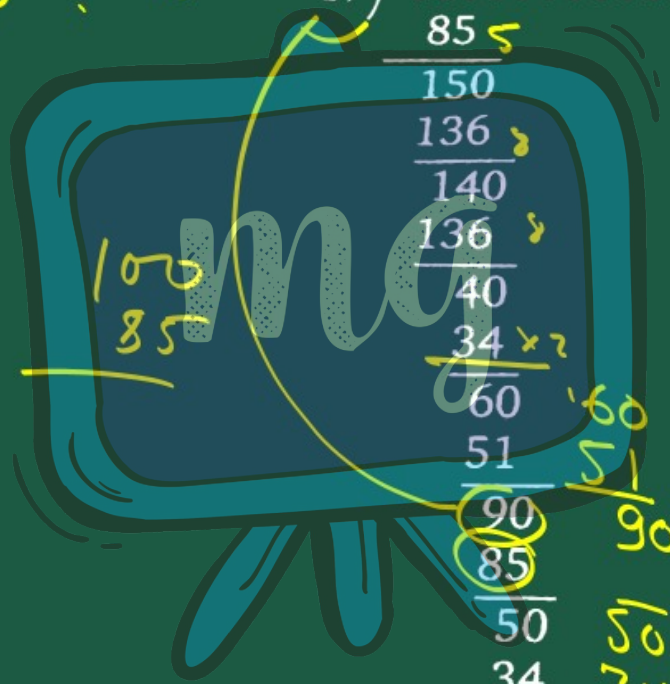

$$
\begin{array}{r|l}
 & 0.0588235294117647\ldots \\
17 & 10000000000000000 \\
\hline
 & 85 \\
\hline
 & 150 \\
 & 136 \\
\hline
 & 140 \\
 & 136 \\
\hline
 & 40 \\
 & 34 \\
\hline
 & 60 \\
 & 51 \\
\hline
 & 90 \\
 & 85 \\
\hline
 & 50 \\
 & 34 \\
\hline
 & 160
\end{array}
$$

$$
\begin{array}{r}
160 \\
153 \\
\hline
70 \\
68 \\
\hline
20 \\
17 \\
\hline
30 \\
17 \\
\hline
130 \\
119 \\
\hline
110 \\
102 \\
\hline
80 \\
68 \\
\hline
120 \\
119 \\
\hline
1
\end{array}
$$

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$$\frac{1}{17} = 0.0588235294117647\ldots$$

16 digits



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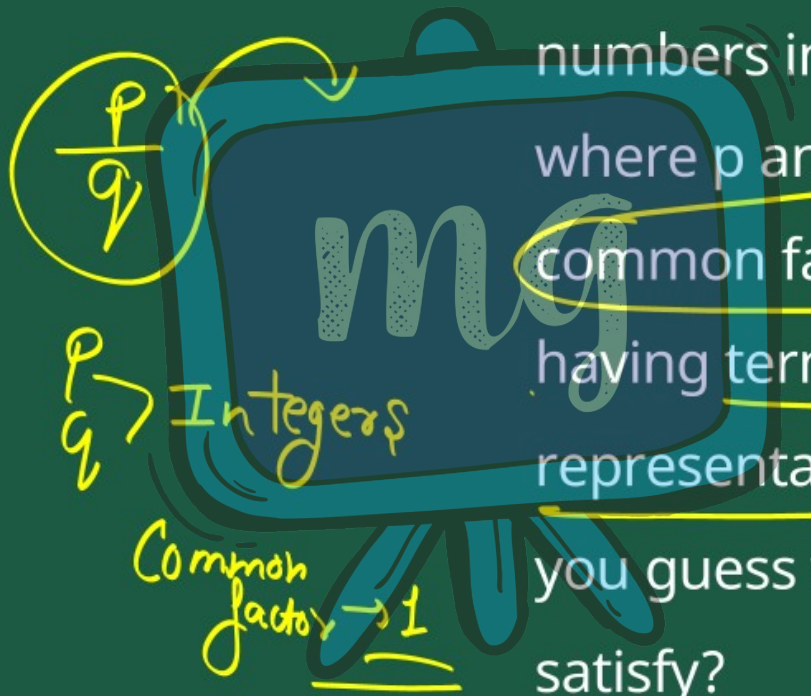

6. Look at several examples of rational numbers in the form $\frac{p}{q}$ $(q \neq 0)$, where p and q are integers with no common factors other than 1 and having terminating decimal representations (expansions). Can you guess what property q must satisfy?

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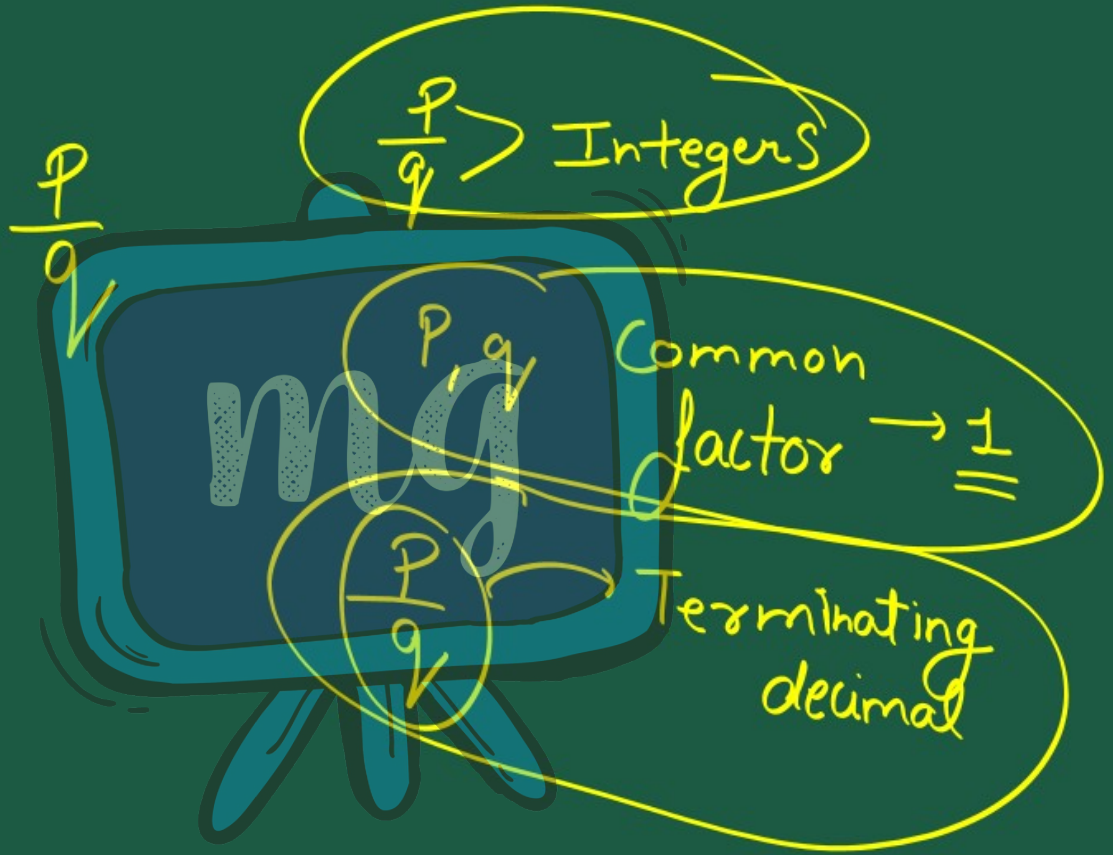

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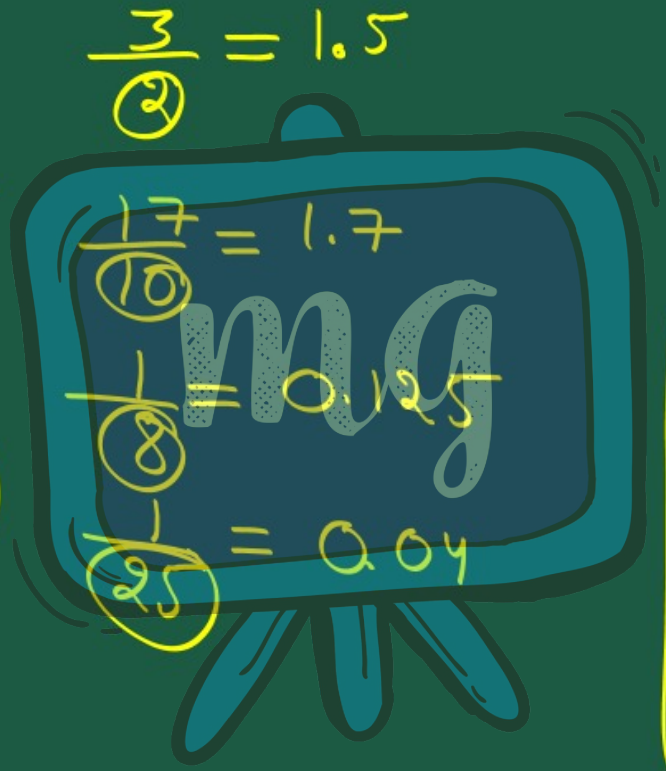

$\frac{3}{2} = 1.5$

$\frac{17}{10} = 1.7$

$\frac{1}{8} = 0.125$

$\frac{1}{25} = 0.04$

$-\frac{17}{20} = 0.85$

$17 = 17 \times 1$

$20 = 2 \times 2 \times 5 \times 1$

$3 = 3 \times 1$

$2 = 2 \times 1$

$2 = 2 \times 1$

$10 = 2 \times 5 \times 1$

$8 = 2 \times 2 \times 2 \times 1$

$25 = 5 \times 5 \times 1$

$20 = 2 \times 2 \times 5 \times 1$

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q has 2, 5 & both (2, 5) as prime factor only

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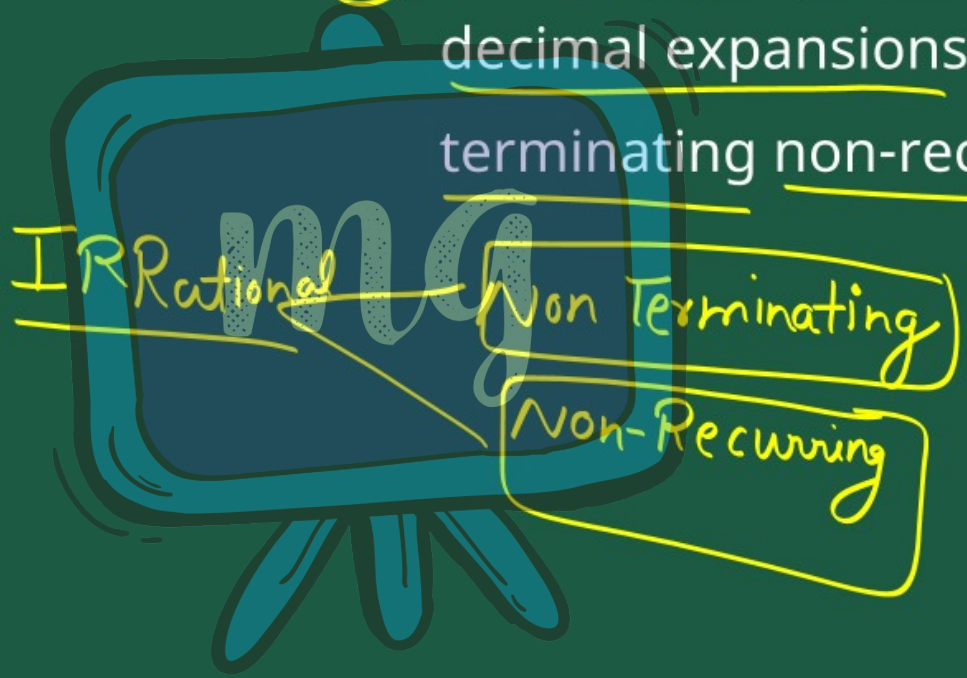
7. Write three numbers whose decimal expansions are non-terminating non-recurring.



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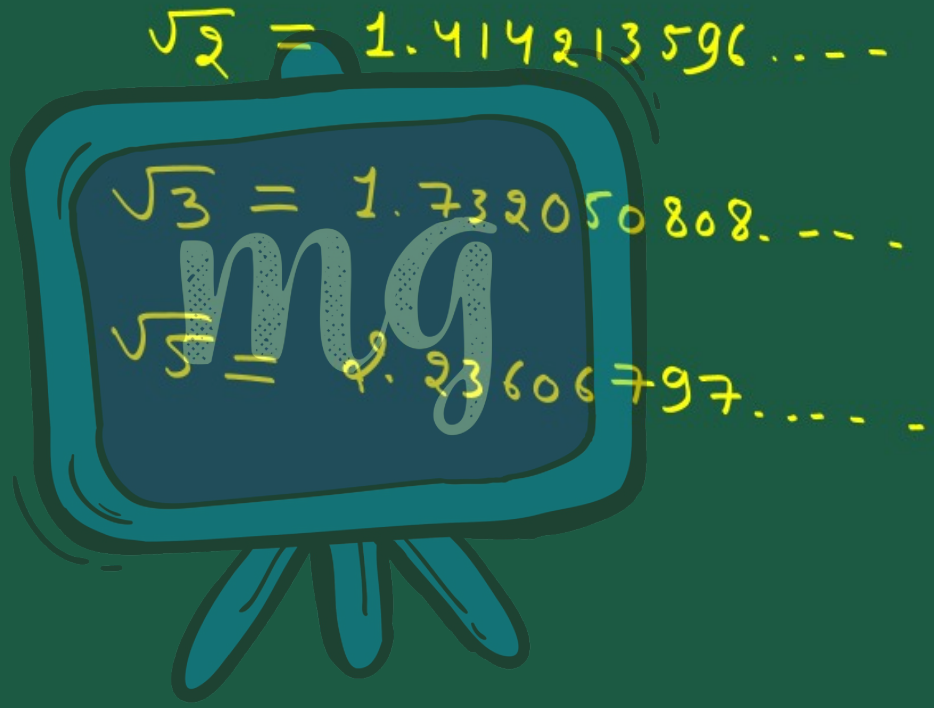

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8. Find three different irrational numbers between the rational numbers $\frac{5}{7}$ and $\frac{9}{11}$.



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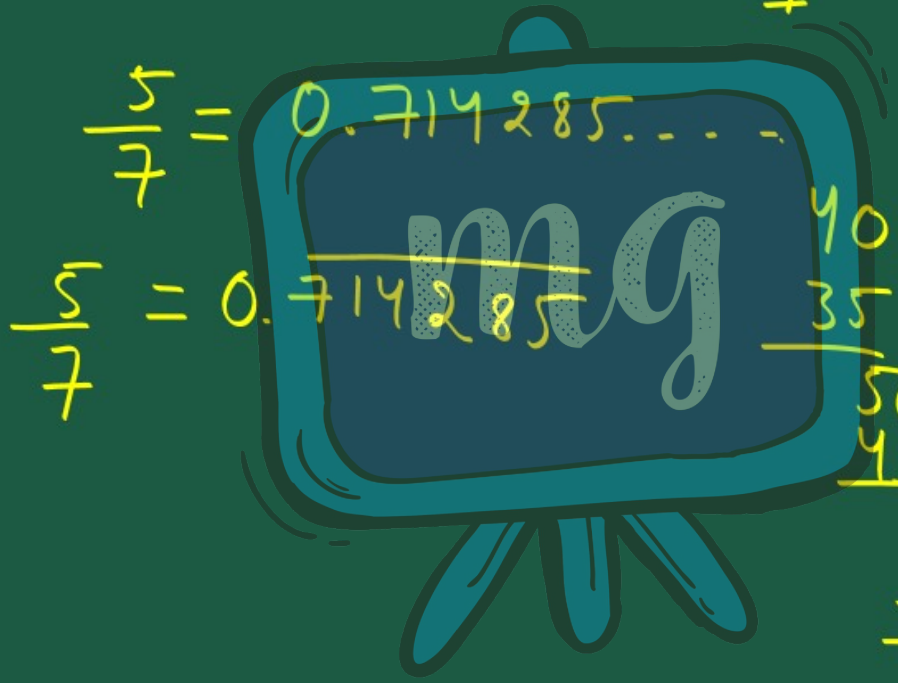
$\frac{5}{7}$

$\frac{5}{7} = 0.714285\ldots\ldots$

$\frac{5}{7} = 0.714285$

40
35
50
49
10
7
3

7 | 50 | 0.714285
49
10
7
30
28
20
14
60
56
4



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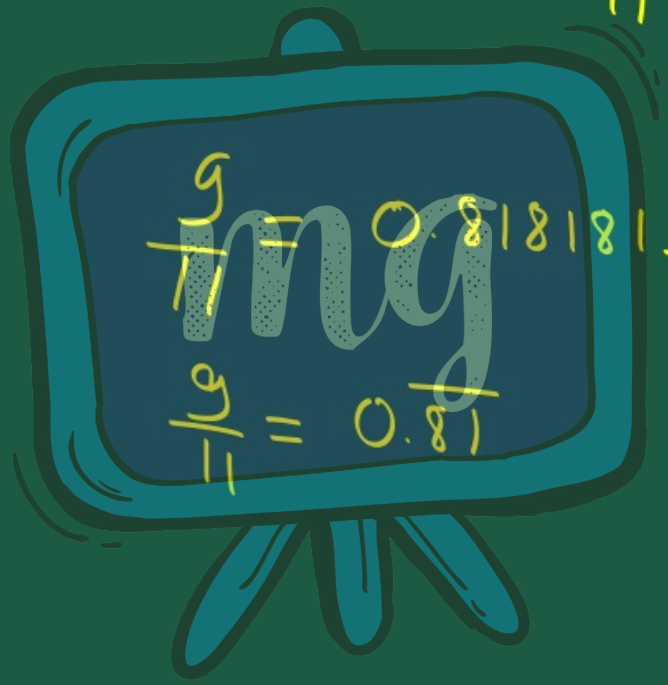

$$\frac{9}{11}$$

$$11 \overline{)\,90\,}\,0.8181\ldots$$

$$\begin{array}{r} 88 \\ \hline 20 \\ 11 \\ \hline 90 \\ 88 \\ \hline 20 \\ 11 \\ \hline 9 \end{array}$$

$$\frac{9}{11} = 0.818181\ldots$$

$$\frac{9}{11} = 0.\overline{81}$$

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$\frac{5}{7} = 0.\overline{714285}$

$\frac{9}{11} = 0.\overline{81}$

IRRational

$0.750750075000\ldots\ldots$

$0.760760076000\ldots\ldots$

$0.780780078000\ldots\ldots$

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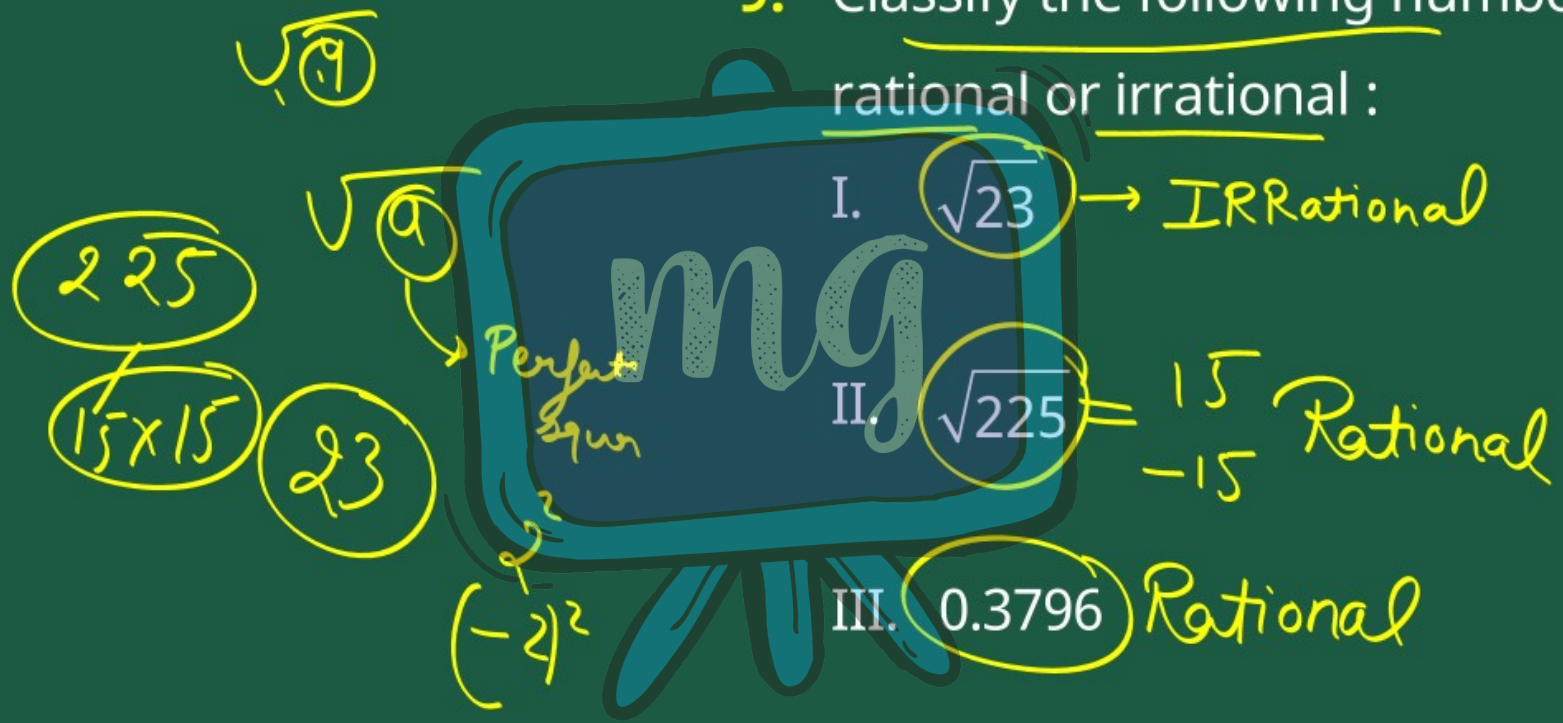

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IV. 7.478478

V. 1.101001000100001.....

