

15/2021

Maths

classmate

Date _____

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→ Worksheet 1

Q1) i-

7 and 8

→ 3 rational numbers between 7 and 8 are...
~~= 7.1, 7.2, 7.3~~

$$\therefore 7 < 7.1 < 7.2 < 7.3 < 8$$

(ii) 9.9 and 10

→ 3 rational numbers between ~~7 and 8~~ 9.9 and 10 are.....

(iii) 2 and 2.01

3 rational numbers between 2 and 2.01 are.....
~~= 2.0001, 2.0002, 2.0003~~

$$\therefore \cancel{2} < 2.0001 < \cancel{2.0002} < 2.0003 < 2.01$$

~~25~~ Insert a rational number

2) $\frac{2}{3}$ and $\frac{5}{7}$

$$\rightarrow \frac{2 \times 7}{3 \times 7} = \frac{14}{21}$$

$$\rightarrow \frac{5 \times 3}{7 \times 3} = \frac{15}{21}$$

(Sir isse kisse multiply karenge)

ii) $\frac{3}{8}$ and $\frac{10}{13}$

$$\frac{3 \times 13}{8 \times 13} = \frac{39}{104}$$

$$\frac{10}{13} \times \frac{8}{8} = \frac{80}{104}$$

$$\therefore \frac{39}{104} \text{ and } \frac{80}{104}$$

Q2) $\frac{5}{7}$ and $\frac{6}{11}$

$$\frac{5}{7} \times \frac{11}{11} = \frac{55}{77}$$

$$\frac{6}{11} \times \frac{7}{7} = \frac{42}{77}$$

$$\therefore \frac{43}{77}$$

Q3) $\frac{5}{9}$ and $\frac{8}{11}$

$$\frac{5}{9} \times \frac{11}{11} = \frac{55}{99}$$

$$\frac{8}{11} \times \frac{9}{9} = \frac{72}{99}$$

$$\therefore \frac{56}{99}, \frac{63}{99}, \frac{69}{99}$$

ii) $\frac{2}{7}$ and $\frac{11}{17}$

$$\frac{2}{7} \times \frac{17}{17} = \frac{34}{119}$$

$$\frac{11}{17} \times \frac{7}{7} = \frac{77}{119}$$

$$\therefore \frac{34}{119}, \frac{77}{119}, \frac{66}{119}$$

iii) $\frac{3}{8}$ and $\frac{10}{13}$

$$\frac{3}{8} \times \frac{13}{13} = \frac{39}{104}$$

$$\frac{10}{13} \times \frac{8}{8} = \frac{80}{104}$$

$$\therefore \frac{39}{104}, \frac{80}{104}$$

Q4) $\frac{17}{125}$

$$125 = 5 \times 5 \times 5 \\ = 2^0 \times 5^3$$

$\therefore 125$ can be represented as $2^m \times 5^n$

$\therefore \frac{17}{125}$ is terminating decimal.

Q5) $\frac{19}{75}$

$$75 = 5 \times 5 \times 3 \\ = 2^0 \times 5^2 \times 3^1$$

$\therefore 75$ cannot be expressed in the form $2^m \times 5^n$

$\therefore \frac{19}{75}$ is not terminating.

Ques 17) $\frac{41}{16}$

$$16 = 2 \times 2 \times 2 \times 2 \\ = 2^4 \times 5^0$$

$\therefore 16$ can be represented in the form $2^m \times 5^n$

$\therefore \frac{41}{16}$ is terminating decimal.

Ques 18) $\frac{31}{50}$

$$50 = 5 \times 5 \times 2 \\ = 5^2 \times 2^1$$

$\therefore 50$ can be represented in the form $2^m \times 5^n$

$\therefore \frac{31}{50}$ is terminating decimal.

$$\text{vi} \frac{5}{11}$$

$$11 = 11 \times 1$$

$\therefore \frac{5}{11}$ is not terminating decimal

$$\text{vii} \frac{23}{3125}$$

$$3125 = 5 \times 5 \times 5 \times 5 \times 5 \\ = 5^5$$

$\therefore 3125$ can be expressed in the form $2^m \times 5^n$

$\therefore \frac{23}{3125}$ is terminating

vii) $\frac{9}{14}$

$$14 = 2 \times 7$$

$$= 2' \times 7'$$

$\therefore 14$ cannot be represented as $2^m \times 5^n$

$\therefore \frac{9}{14}$ is not terminating

viii) $\frac{18}{35}$

$$35 = 5 \times 7$$

$$= 5' \times 7'$$

$\therefore 35$ cannot be represented as $2^m \times 5^n$

$\therefore \frac{18}{35}$ is not terminating.

ix) $\frac{37}{80}$

$$80 = 5 \times \cancel{2} \times 2 \times 2 \times 2 \times 2$$

$$= 5' \times 2^4$$

$\therefore 80$ can be represented

$\frac{37}{80}$ ~~can be represented~~ is terminating.

ex) $\frac{5}{12}$

$12 = \cancel{2 \times 2 \times 2 \times 2} \times 3$

$\therefore 12$ cannot be represented as $2^m \times 5^n$

$\therefore \frac{5}{12}$ is not terminating.

ex) $\frac{9}{5}$

$= 1.8$

$$\begin{array}{r} 1.8 \\ 5 \overline{) 9.0} \\ \underline{-5} \\ 40 \\ \underline{-40} \\ 00 \end{array}$$

$\frac{13}{25}$

~~$\frac{13}{25}$~~

1.923076

$$\text{iii)} \frac{19}{125}$$

$$= 6.5789 \dots$$

$$\text{iv)} \frac{78}{65}$$

$$= 0.8\dot{3}$$

$$\text{Q6)} \textcircled{i} 0.7$$

$$\text{ii)} 0.3\overline{9}$$

$$\textcircled{1} \Rightarrow \text{let } x = 0.3\overline{9}$$

$$\therefore 100x = \cancel{0.39} 0.3\overline{9} \times 100$$

$$\textcircled{2} \Rightarrow 100x = \cancel{0} 39\overline{39} \dots$$

Equation $\textcircled{2} - \textcircled{1}$

$$100x = 39.3\overline{9}$$

$$x = 0.3\overline{9}$$

$$99x = 39$$

$$x = \frac{39}{99}$$

$$\therefore 0.\overline{39} = \frac{39}{99}$$

$$\text{iii)} \quad 1.\overline{42}$$

$$\textcircled{1} \rightarrow 10^{\overline{1}} x = 1.\overline{49}$$

$$\therefore 100x = 1.\overline{49} \times 100$$

$$\textcircled{2} \rightarrow 100x = 149.\overline{49}$$

Equation $\textcircled{2} - \textcircled{1}$

$$100x = 149.\overline{49}$$

$$x = 1.\overline{49}$$

$$99x = 148$$

$$x = \frac{148}{99} \quad \neq$$

$$\text{iv)} \quad 0.\overline{213}$$

$$\text{①} \rightarrow \text{let, } x = 0.\overline{213} \dots$$

$$1000x = 0.\overline{213} \times 1000$$

$$\text{②} \rightarrow \underset{\sim}{1000}x = \cancel{213.213} - 213.213$$

Equation 2 - 1

$$\left. \begin{array}{l} 1000x = 213.213 \\ x = 0.213 \end{array} \right\} \text{subtracting}$$

$$999x = 213$$

$$x = \frac{213}{999}$$

$$\therefore 0.\overline{213} = \frac{213}{999}$$

$$v) \ 0.\overline{285}$$

$$\textcircled{1} \rightarrow \text{let, } x = 0.285$$
$$1000x = 0.285 \times 1000$$

$$\textcircled{2} \rightarrow 1000x = \cancel{2.85} 285.285$$

equation 2-1

$$\cancel{10}x \quad 1000x = \cancel{2.85} 285.285$$
$$x = \quad \quad \quad 0.285$$

$$999x = 285$$

$$x = \frac{285}{999}$$

$$\therefore 0.\overline{285} = \frac{285}{999}$$

- Q1> i) Rational
 ii) Irrational
 iii) Irrational
 iv) Irrational

- Q2> i) false
 ii) true
 iii) true
 iv) false
 v) true
 vi) false
 vii) true

$$\begin{aligned} Q3> i) 2\sqrt{5}^2 &= (2)^2 + 2 \times 2 \times \sqrt{5} + (\sqrt{5})^2 \\ &= 4 + 4\sqrt{5} + 5 \\ &= 9 + 4\sqrt{5} \\ &\therefore \text{irrational.} \end{aligned}$$

$$ii) \frac{\sqrt{147}}{\sqrt{3}} = \frac{(\sqrt{147})^2}{(\sqrt{3})^2}$$

$$= \frac{147}{3} = \text{Rational number}$$

iii) $\sqrt{\frac{4}{5}}$

iv) $\frac{-2}{3}$ - Rational

v) $\frac{\pi}{2}$ - Irrational.

— — —

~~Q4) $\sqrt{10}$~~ Q5) i) $2 + \sqrt{5} = (2)^2 + 2 \times 2 \times \sqrt{5} + (\sqrt{5})^2$
 $= 4 + 4\sqrt{5} + 5$
 $= 9 + 4\sqrt{5}$
 $= \text{Irrational.}$

ii) $3 - \sqrt{5} = (3)^2 - 2 \times 3 \times \sqrt{5} + (\sqrt{5})^2$
 $= 9 - 6\sqrt{5} + 5$
 $= 14 - 6\sqrt{5}$
 $= \text{Irrational.}$

iii) $\sqrt{2} + \sqrt{5} = (\sqrt{2})^2 + 2 \times \sqrt{2} \times \sqrt{5} + (\sqrt{5})^2$
 $= 2 + 2\sqrt{10} + 5$
 $= 7 + 2\sqrt{10}$
 $= \text{Irrational.}$