Page No.:
Date 13/7/2020

Chapter ⇒ 2
Real Number.

1 Natural Number → 1, 2, 3 - - - - -

2 Whole Number → 0, 1, 2, 3, 4, 5 - - - -.

3. Integer — $\underbrace{-3, -2, -1}_{\text{Negativ Integer}}, 0, \underbrace{1, 2, 3}_{\text{Positive Integer}}$ - - - -

4. Rational Number → Number which can be represented in P/q
P and q are integers and where $q \neq 0$
Ex → $\frac{1}{4}, \frac{2}{3}$

(i) Terminate after definite decimal expansion
ex ⇒ $\frac{1}{4} = 0.25$, $\frac{2}{16} = 0.125$

(ii) Non Terminate but repeating decimal expansion
Ex → $\frac{2}{3} = 0.666$, $\frac{100}{7} = 14.2857142$

Prime Number ⇒ Natural Number greater than one which is not di[illegible] by any number except 1 and itself
Ex - 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 etc.

Irrational Number → Number which can't be expressed in P/[illegible] where P & q are integer & where $q \neq 0$
Ex ⇒ $\sqrt{2}, \sqrt{3}, \sqrt{5}, \sqrt{7}$

Composite No → Natural no. which is divisible by no. other than 1 and itself.

Euclid division Lemma → A lemma is proven statement which is used to prove other statement

→ Euclid division Lemma is a restatement of long division process.

→ Divident

Divisor = b ⌋ a ⌊ q → quoteint

r → remainder

$$a = bq + r$$

where $0 < r < b$

a, b, q, r integers.

Exercise => 2.1

Q-1 Square of any positive odd integers is of the form $4q+1$, where q is any integer

Ans Let a is any positive integer and $b => 2$
By euclid division lemma there exists integer m and r such that $0 \le r < 2$

$$a = 2m + r$$

$$(r = 0, 1)$$

By putting = $a = 2m + r$ | $a = 2m + r$
$a = \cancel{m}2m + 0$ | $a = 2m + 1$
$a = 2m$

$a = 2m + 1$
$a^2 = (2m+1)^2$
$= (a+b)^2 = a^2 + 2ab + b^2$
$\Rightarrow 2m^2 + 2 \times 2m \times 1 + 1^2$
$\Rightarrow 4m^2 + 4m + 1$
$a^2 \Rightarrow 4(m^2 + m) + 1$
$a^2 \Rightarrow 4q + 1 \quad (q = m^2 + m)$

So, a is any positive odd integer and square of it can be written forme of $4q+1$

Q-2 Use Euclid lemma to show that cube of any positive integer is of the form $9q$ or $9q+1$ or $9q+8$ when q is some integer.

Ans Let a is any positive integer. $b = 3$
By Euclid division lemma there eaits integer m and r such that $= a = 3m + r$

$$(r = 0, 1, 2)$$

Anant Gyan
Page No.:
Date: / /20

By putting the value

$a = 3m + r$	$a = 3m + r$	$a = 3m + r$
$a = 3m + 0$	$a = 3m + 1$	$a = 3m + 2$
$a = 3m$		

Case 1 $a = 3m$
$(a)^3 = (3m)^3$
$(a)^3 = 27m^3$
$(a)^3 = 9(3m^3)$
$Sq \Rightarrow 3m^3$
$(a)^3 = 9q$

Case ② $a = 3m + 1$
$(a)^3 = (3m+1)^3$
$= (a)^3 + 3(a)^2(b) + 3(a)(b)^2 + (b)^3$
$= (3m)^2 + 3(3m)^2(1) + 3(3m)(1)^2 + (1)^3$
$\Rightarrow 27m^3 + 27m^2 + 9m + 1$
$(a)^3 \Rightarrow 9(3m^3 + 3m^2 + m) + 1$
$Sq = 3m^3 + 3m^2 + m)$
$= 9q + 1$

Case 3 $a = 3m + 2$
$(a)^3 = (3m+2)^3$
$\Rightarrow (a)^3 + 3(a)^2(b) + 3(a)(b)^2 + (b)^3$
$= (3m)^3 + 3(3m)^2(2) + 3(3m)(2)^2 + (2)^3$
$= 27m^3 + 54m^2 + 36m + 8$
$= 9(3m^3 + 6m^2 + 4m) + 8$ $\quad Sq = 3m^3 + 6m^2 + 4m)$
$9q + 8$

So, a is any positive integer and cube can express in form of $9q$ or $9q+1$ or $9q+8$.

Date : 14/7/2020

Q-3. Show that any positive odd integer is of the form $6q+1$ or $6q+3$ or $6q+5$ where q is positive integers.

Ans Let a is any positive Integer and $b = 6$

By Euclid division lemma ther exists integer q and r such that

$a = 6q + r$

$(r = 0, 1, 2, 3, 4, 5)$

By putting the Value.

$a = 6q + 0 = 6q$ (even)

$a = 6q + 1$ (odd)

$a = 6q + 2$ (even)

$a = 6q + 3$ (odd)

$a = 6q + 4$ (even)

$a = 6q + 5$ (odd)

So, a is any positive integer can express in the form of $6q+1$ or $6q+3$ or $6q+5$.

Q-4 Use Euclid's division algorithm find HCF.

(1) 210, 55.

$210 > 55$

By Euclid's division

$d \times q + r$.

Anant Gyan
Page No.:
Date: / /20

(i) $210 = 55 \times 3 + 45 \quad (r \neq 0)$
(ii) $55 = 45 \times 1 + 10 \quad (r \neq 0)$
(iii) $45 = 10 \times 4 + 5 \quad (r \neq 0)$
(iv) $10 = 5 \times 2 + 0 \quad (r = 0)$
HCF = 5 Ans.

(ii) 420, 130
$420 > 130$
By Euclid's division
(i) $420 = 130 \times 3 + 30 \quad (r \neq 0)$
(ii) $130 = 30 \times 4 + 10 \quad (r \neq 0)$
(iii) $30 = 10 \times 3 + 0 \quad (r = 0)$
HCF = 10 Ans.

(iii) 243, 75
$243 > 75$
By Euclid's division
(i) $243 = 75 \times 3 + 18 \quad (r \neq 0)$
$75 = 18 \times 4 + 3 \quad (r \neq 0)$
$18 = 3 \times 6 + 0 \quad (r = 0)$
H.C.F = 3 Ans.

(iv) 135, 225

Page No.:
Date: / /20

Ans $225 > 135$

By Euclid's division.

(i) $225 = 135 \times 1 + 90 \; (r \neq 0)$

(ii) $135 = 90 \times 1 + 45 \; (r \neq 0)$

(iii) $90 = 45 \times 2 + 0 \; (r = 0)$

$H.C.F = 45$ Ans

$$\begin{array}{r} 135 \,\big)\, 225 \,(\, 1 \\ -135 \\ \hline 90 \,\big)\, 135 \,(\, 1 \\ -90 \\ \hline 45 \,\big)\, 90 \,(\, 2 \\ -90 \\ \hline 0 \end{array}$$

(v) 38220, 196

$\because 38220 > 196$

By Euclid's division

(i) $38220 = 196 \times 195 + 0 \; (r = 0)$

196 HCF

$$\begin{array}{r} 196 \,\big)\, 38220 \,(\, 195 \\ -38220 \\ \hline 0 \end{array}$$

(vi) 867, 255

$867 > 255$

By Euclid's division

(i) $867 = 255 \times 3 + 102 \; (r \neq 0)$

(ii) $255 = 102 \times 2 + 51 \; (r \neq 0)$

(iii) $102 = 51 \times 2 + 0 \; (r = 0)$

$HCF = 51$ Ans.

$$\begin{array}{r} 255 \,\big)\, 867 \,(\, 3 \\ -765 \\ \hline 102 \,\big)\, 255 \,(\, 2 \\ 204 \\ \hline 51 \,\big)\, 102 \,(\, 2 \\ -102 \\ \hline 0 \end{array}$$

Q.5) If HCF of number 408 and 1032 is expressed in the form of 1032 $x - 408 \times 5$, find x.

Anant Gyan
Page No.:
Date : / / 20

Ans $1032 > 408$.

By Euclid's division

(i) $1032 = 408 \times 2 + 216 \quad (r \neq 0)$

(ii) $408 = 216 \times 1 + 192 \quad (r \neq 0)$

(iii) $216 = 192 \times 1 + 24 \quad (r \neq 0)$

(iv) $192 = 24 \times 8 + 0 \quad (r = 0)$

HCF = 24

$$1032x - 408 \times 5 = 24$$
$$1032x - 2040 = 24$$
$$1032x = 24 + 2040$$
$$1032x = 2064$$
$$x = \frac{\cancel{2064}}{\cancel{1032}} = 2 \text{ Ans}$$

$$\begin{array}{r|l|l} 408 & 1032 & 2 \\ & -816 & \\ \hline 216 & 408 & 1 \\ & -216 & \\ \hline 192 & 216 & 1 \\ & -192 & \\ \hline 24 & 192 & 8 \\ & -192 & \\ \hline & 0 & \end{array}$$

Exercise ⇒ 1.2.2

Fundamental Theorum of ~~AR~~ Arthimetic

Every integer is either a prime ~~no~~ number or (if composite number) can be represented as the product of prime numbers and these representation is Unique, except for order.

Ex 420

2	420
2	210
3	105
5	35
7	7
	1

Q1 Express in form of prime factors.

(i) 468

2	468
2	234
3	117
3	39
13	13
	1

$468 \Rightarrow 2 \times 2 \times 3 \times 3 \times 13$

$468 \Rightarrow 2^2 \times 3 \times 13.$

(ii) 140

2	140
2	70
5	35
7	7
	1

$140 \Rightarrow 2 \times 2 \times 5 \times 7$

$140 \Rightarrow 2^2 \times 5 \times 7$

Page No.:
Date: / /20

(iii) 945

3	945
3	315
3	105
5	35
7	7
	1

$945 = 3 \times 3 \times 3 \times 5 \times 7$
$3^3 \times 5 \times 7$

(iv) 3825

3	3825
3	1275
3	425
5	85
17	17
	1

$3825 \Rightarrow 3 \times 3 \times 5 \times 5 \times 17$
$\Rightarrow 3^2 \times 5^2 \times 17$

(v) 20570

2	20570
5	10285
11	2057
11	187
17	17
	1

$20570 \Rightarrow 2 \times 5 \times 11 \times 11 \times 17$
$\Rightarrow 2 \times 5 \times 11^2 \times 17$

Q-2 Find the LCM and HCF of the following numbers and Verify the HCF × LCM = product of the numbers.

Relation $HCF(a,b) \times LCM(a,b) = a \times b$.

(i) 96, 404.

Sol.

2	96
2	48
2	24
2	12
2	6
3	3
	1

2	404
2	202
101	101
	1

Or

2	96, 404
2	48, 202
2	24, 101
2	12, 101
2	6, 101
3	3, 101
101	1, 101
	1, 1

Date : / /20

$96 \Rightarrow 2 \times 2 \times 2 \times 2 \times 2 \times 3 \Rightarrow 2^5 \times 3$

$404 \Rightarrow 2 \times 2 \times 101 \Rightarrow 2^2 \times 101$

HCF $\Rightarrow 2 \times 2 = 4$

LCM $= 2^5 \times 3 \times 101 \Rightarrow 9696$.

HCF × LCM $\Rightarrow 96 \times 404$

$4 \times 9696 = 38784 \Rightarrow 38784$ Ans.

ii) 336, 54.

Sol.

2	336
2	168
2	84
2	42
3	21
7	7
	1

2	54
3	27
3	9
3	3
	1

Or

2	336 ; 54
2	168 ; 27
2	84, 27
3	42, 27
3	21, 27
3	7, 9
3	7, 3
7	7, 1
	1, 1

$336 \Rightarrow 2 \times 2 \times 2 \times 3 \times 7 = 2^4 \times 3 \times 7$

$54 \Rightarrow 2 \times 3 \times 3 \times 3 = 2 \times 3$

HCF $= 2 \times 3 = 6$, LCM $= 2^4 \times 3^3 \times 7$

HCF × LCM $= 336 \times 54$

$6 \times 3024 = 18144$

18,144

Page No.:
Date: / /20

(iii) 90, 144

Ans

2	90
3	45
3	15
5	5
	1

2	144
2	72
2	36
2	18
3	9
3	3
	1

Or

2	90, 144
2	45, 72
2	45, 36
2	45, 18
3	45, 9
3	15, 3
5	5, 1
	1, 1

$90 = 2 \times 3 \times 3 \times 5 \Rightarrow 2 \times 3^2 \times 5$

$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \Rightarrow 2^4 \times 3^2$

$HCF = 2 \times 3 \times 3 \Rightarrow 18$

$LCM = 2^4 \times 3^2 \times 5 = 720$

$HCF \times LCM$

$18 \times 720 = 90 \times 144$

$\Rightarrow 12960 = 12960.$

Page No.:
Date 29/July 2020

Q-3. Find the LCM and HCF of the following integers by applying the Prime factorisation method.

(i) 12, 15 and 21.

Ans.

2 | 12
2 | 6
3 | 3
  | 1

3 | 15
5 | 5
  | 1

3 | 21
7 | 7
  | 1

$12 = 2 \times 2 \times 3 \; / \; 2^2 \times 3$

$15 = 3 \times 5$

$21 = 3 \times 7$

$HCF \Rightarrow 3$

$LCM \Rightarrow 2^2 \times 3 \times 5 \times 7 \Rightarrow 420^\circ$

(b) 24, 15, 36

Ans

2 | 24
2 | 12
2 | 6
3 | 3
  | 1

3 | 15
5 | 5
  | 1

2 | 36
2 | 18
3 | 9
3 | 3
  | 1

$24 \Rightarrow 2 \times 2 \times 2 \times 3 \; / \; 2^3 \times 3$

$15 \Rightarrow 3 \times 5$

$36 \Rightarrow 2 \times 2 \times 3 \times 3 \; / \; 2^2 \times 3^2$

$HCF \Rightarrow 3$

$LCM \Rightarrow 2^3 \times 3^2 \times 5 = 360$

1(c) 17, 23, 29.

Ans

17	17
	1

23	23
	1

29	29
	1

17 => 17 × 1
23 => 23 × 1
29 => 29 × 1
HCF => $\underline{1}$
LCM => 17 × 23 × 29
=> 11339.

1d) 6, 72, 120

Ans

2	6
3	3
	1

2	72
2	36
2	18
3	9
3	3
	1

2	120
2	60
2	30
3	15
5	5
	1

6 => 2 × 3
72 => 2 × 2 × 2 × 3 × 3
120 => 2 × 2 × 2 × 3 × 5
HCF => 2 × 3 = 6
LCM = $2^3 \times 3^2 \times 5$
= 360

(e) 40, 36 and 126

$$\begin{array}{c|c} 2 & 40 \\ \hline 2 & 20 \\ \hline 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \qquad \begin{array}{c|c} 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{c|c} 2 & 126 \\ \hline 3 & 63 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$40 = 2 \times 2 \times 2 \times 5 = / 2^3 \times 5$

$36 = 2 \times 2 \times 3 \times 3 / 2^2 \times 3^2$

$126 \Rightarrow 2 \times 3 \times 3 \times 7 / 2 \times 3^2 \times 7$

HCF $= 2$

LCM $= 2^3 \times 3^2 \times 5 \times 7 = 2520$ Ans.

(f) 8, 9 and 25.

$$\begin{array}{c|c} 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array} \qquad \begin{array}{c|c} 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{c|c} 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$8 = 2 \times 2 \times 2 / 3^3 \times 1$

$9 = 3 \times 3 / 3^2 \times 1$

$25 = 5 \times 5 / 5^2 \times 1$

HCF $= 1$

LCM $= 2^3 \times 3^2 \times 5^2$.

Q-4 There is circular. path around a sports field. Raman takes and min to complete one round of the circular path while anupriya takes 12 min for the same suppose both of them start from the same point and at the same time and go in the same direction. After how many min. will they meet against at starting point.

2	18
3	9
3	3
	1

2	12
2	6
3	3
	1

$18 = 2 \times 3 \times 3 = 2 \times 3^2$

$12 = 2 \times 2 \times 3 = 2^2 \times 3$

$LCM = 2^2 \times 3^2 = 4 \times 9 = 36$ Min

Q-5 In a seminar number of participants in Hindi and Eng and Math are 60, 84, and 108. If equal no. of participants of same subject are setting in each room then find the least no of room required

2	60
2	30
3	15
5	5
	1

2	84
2	42
3	21
7	7
	1

2	108
2	54
2	27
3	9
3	3
	1

$60 = 2^2 \times 3 \times 5$

$84 = 2^2 \times 3 \times 7$

$108 = 2 \times 2 \times 3^3$

$HCF = 2^2 \times 3 = 12$

Page No.:
Date: / /20

$$\text{Required room} = \frac{\text{Total Participants}}{\text{Participants in one room (H.C.F)}}$$

$$= \frac{60 + 34 + 108}{12}$$

$$= \frac{252}{12} = 21$$

Exercise ⇒ 2·3

Theorem (2.3) → Let 'P' is a prime and 'a' is positive integer, if 'P' divided a^2 then P also divide 'a'

Ex → 2 divides 36 (6^2) then 2 also divides '6'.

Co-prime → Two positive integer are know as Co-prime if they have only one Common Factor i.e. 1.
Ex - (2,3)

Proof by Irrationality

Proof by Contradiction

We want to proof 'y statement'
(i) We assume 'not y'
(ii) Find Contradiction
(iii) Claim 'not y' is false it
(iv) means 'y' statement true.

Q-1 Prove that $5-\sqrt{3}$ is irrational

Sol. Suppose $5-\sqrt{3}$ is rational number then $5-\sqrt{3}$ can be expressed as $5-\sqrt{3}=\frac{P}{q}$ (Where P and q are co-prime, $q \neq 0$)

$$5-\sqrt{3}=\frac{P}{q}$$

Page No.:
Date: / /20

$$\frac{5}{1} - \frac{P}{q} = \sqrt{3}$$

$$\frac{5q - P}{q} = \sqrt{3}$$

Since 5, P, q are integers, so $\frac{5q-P}{q}$ is a rational numbers. Because it is equal to $\sqrt{3}$. so $\sqrt{3}$ is rational but this contradiction the fact that $\sqrt{3}$ is irrational number so our hypothesis is wrong so we can conclude that 5-$\sqrt{3}$ is irrational number.

Q-2. Prove that $1/\sqrt{2}$ is irrational.

Sol. suppose $1/\sqrt{2}$ is a rational number then $1/\sqrt{2}$ ~~can~~ can be expressed as $\frac{1}{\sqrt{2}} = \frac{P}{q}$ (where P and q are co-prime and q ≠ 0)

$$\frac{\sqrt{2}}{2} = \frac{P}{q}$$

$$\sqrt{2} = \frac{2P}{q}.$$

since 2, P, q are integers, so $\frac{2P}{q}$ is a rational no.

Because it is equal to $\sqrt{2}$. So, $\sqrt{2}$ is rational no. but this contradict the fact $\sqrt{2}$ is irrational no. So. Our hypothesis is wrong. So we can conclude that $\frac{1}{\sqrt{2}}$ is irrational number.

(ii) $6 + \sqrt{2}$.

Anant Gyan
Page No.:
Date : / /20

Sol Suppose $6+\sqrt{2}$ is a rational number then $6+\sqrt{2}$ can be expressed as $\frac{6}{\sqrt{2}} = \frac{P}{q}$ (where P and q are co-prime and $q \neq 0$)

$$\sqrt{2} = \frac{P}{q} - 6$$

$$\sqrt{2} = \frac{P-6q}{q}$$

since 6, P, q are integers. so $\frac{P-6q}{q}$ is rational no.

Because it is equal to $\sqrt{2}$, so $\sqrt{2}$ is rational no. but this contradict the fact $\sqrt{2}$ is irrational no. so ~~or~~ our hypothesis is wrong. so we can conclude that $6+\sqrt{2}$ is irrational no.

Date : / / 20

(iii) $3\sqrt{2}$

Ans Let us assume the Contrary that $3\sqrt{2}$ is Rational

$$3\sqrt{2} = \frac{P}{q} \quad (P \text{ and } q \text{ are co-prime})$$

$$\sqrt{2} = \frac{P}{3q}.$$

$\frac{P}{3q}$ is in the form of $\frac{P}{q}$ then it is Rational.

But we know that ~~$\sqrt{2}$~~, $\sqrt{2}$ is irrational

So, the Contradict is arisen because of our incorrect assumption

Q-3. Prove that $\sqrt{p}+\sqrt{q}$ is irrational

Sol. Suppose $\sqrt{p}+\sqrt{q}$ is rational number then can be expressed as $\rightarrow$

$$\sqrt{p}+\sqrt{q} = \frac{a}{b} \quad \text{(where } a, b \text{ are co-prime)} \quad (b \neq 0)$$

$$\sqrt{p}+\sqrt{q} = \frac{a}{b}$$

$$\therefore \sqrt{q} = \frac{a}{b} - \sqrt{p}$$

both side square

$$(\sqrt{q})^2 = \left(\frac{a}{b} - \sqrt{p}\right)^2$$

$$q = \left(\frac{a}{b}\right)^2 - 2\left(\frac{a}{b}\right)\left(\sqrt{p}\right) + (p)$$

$$q = \frac{a^2}{b^2} - 2\frac{a}{b}\sqrt{p} + p$$

$$2\frac{a}{b}\sqrt{p} \Rightarrow \frac{a^2}{b^2} + \frac{p}{1} - \frac{q}{1}$$

$$2\frac{a}{\cancel{b}}\sqrt{p} \Rightarrow \frac{a^2+b^2(p-q)}{\cancel{b^2}\,1} \quad [\sqrt{p}+\sqrt{q} \text{ is irrational}$$

$$\sqrt{p} \Rightarrow \frac{a^2+b^2(p-q)}{2ab}$$

a, b, p, q are integer $\frac{a^2+b^2(p-q)}{2ab}$ is rational number. Because it is equal to $\sqrt{p}$ so $\sqrt{p}$ is a rational no. But it contradict the fact that $\sqrt{p}$ is irrational number so our hypothesis is wrong

Date: 30 July 2020

Exercise → 2.4

DECIMAL EXPANSION OF RATIONAL NUMBER

Rational Number can be expressed in form of : $\frac{p}{q}$ where (p, q) Co-prime $q \neq 0$

$\frac{p}{q}$ Decimal Expansion

Terminating Decimal expansion → q Can be expressed in form of $2^m \times 5^n$

Non Terminating Repeating Decimal expansion → If q Can't be expressed in form of $2^m \times 5^n$ Also has other prime number

Q.1 Without actually performing the long division state whether the following numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion

(i) $\frac{15}{1600} \Rightarrow \frac{15}{2^6 \times 5^2}$ ⇒ Denominator 1600 of $15/1600$ is in form so Terminating decimal expansion.

(ii) $\frac{13}{3125} \rightarrow \frac{13}{5^5 \times 2^0}$ → Denominator 3125 of $13/3125$ in form $2^m \times 5^n$. So Terminating decimal expansion

(iii) $\frac{23}{2^3 \times 5^2}$ → Denominator $2^3 \times 5^2$ of $23/2^3 \times 5^2$ is in form of 2^m, so Terminating decimal expansion

(iv) $\frac{17}{6} \Rightarrow \frac{17}{2\times3} \Rightarrow$ Denominator 2×3 of $17/6$ is in not in form of $2^m\times5^n$. so Non-terminating decimal expansion

(v) $\frac{129}{2^2\times5^2\times7} \Rightarrow$ Denominator $2^2\times5^2\times7$ of $129/2^2\times5^2\times7$ is in not in form of $2^m\times5^n$. so Non-Jerminating decimal expansion

(vi) $\frac{35}{50} \Rightarrow \frac{35}{2^1\times5^2} \Rightarrow$ Denominator $2^1\times5^2$ of $35/150$ is inform of $2^m\ 5^n$ so Jerminating decimal expansion.

(vii) $\frac{7}{80} \Rightarrow \frac{7}{2^4\times5} \Rightarrow$ Denominator $2^4\times5$ of $7/80$ is in form of $2^m\times5^n$ So Jerminating decimal expansion

Q-2 Write dow the decimal expansion of those rational numbers

(i) $\frac{13}{125} \Rightarrow \frac{13}{5\times5\times5} = \frac{13}{5^3\times2^0} \Rightarrow$ Denominator 125 is in form of $2^m\times5^n$ so Jerminating decimal expansion

$\frac{13}{5^3}\times\frac{2^3}{2^3} = \frac{13\times8}{(5\times2)^3} = \frac{104}{1000} \Rightarrow 0.104$

(ii) $\frac{1458}{625} \Rightarrow \frac{14588}{5\times5\times5\times5} \Rightarrow \frac{14588}{5^4\times2^0} \Rightarrow$ Denominator 625 is in form of $2^m\times5^n$. So Jerminating decimal expansion

$\frac{14588}{6^4}\times\frac{2^4}{2^4} \Rightarrow \frac{14588\times16}{(10)^4} \Rightarrow \frac{233408}{10000} \Rightarrow 23.3408$

(iii) $\frac{49}{500} \Rightarrow \frac{49}{2^2\times5^3} \Rightarrow$ Denominator 500 is in form of $2^m\times5^n$ so. Jerminating decimal expansion

Page No.:
Date: / /20

$\frac{49}{2^3 \times 5^3} \times \frac{2^1}{2^1} \Rightarrow \frac{49 \times 2}{10^3} \Rightarrow \frac{98}{1000} = 0.098$

Q.3 Decide whether they are rational or not: If rational write the note on prime factors of its denominator

(i) 0.120120012000.120000 ⇒ Decimal expansion is non terminating and non-rep is it irrational number

(ii) 43.123456789

$\frac{43123456789}{10^9} \Rightarrow \frac{43123456789}{2^9 \times 5^9} \Rightarrow$ Denominator is $2^9 \times 5^9$ Prime factor Contain in 2 and 5.

It is in form of $2^m \times 5^n$ so it is Rational number with terminating expansion.