CLASS 46

HCF - LCM

(#) HCF of 20 & 25

$$20\overline{)25}\,(1 \quad 20 \quad 5\overline{)20}\,(4 \quad 20 \quad 0$$

HCF (last divisor)

HCF of 24 & 90

$$24\overline{)90}\,(3 \quad 72 \quad 18\overline{)24}\,(1 \quad 18 \quad 6\overline{)18}\,(3 \quad 18 \quad 0$$

HCF

(1) finding the HCF by long division method the sequence of quotient from top to bottom is 3, 1, 3 and the last divisor is 6. find the sum of both the numbers.

sequence को bottom to top लिखना है।

$6 \times 3 + 0 = 18$

$18 \times 1 + 6 = 24$

$24 \times 3 + 18 = 90$

OR

$$24\overline{)90}\,(3 \quad -72 \quad 18\overline{)24}\,(1 \quad -18 \quad 6\overline{)18}\,(3 \quad -18 \quad 0$$

$24 + 90 = 114$

(2) finding the HCF by long division method of two no's the sequence of quotient from top to bottom is 9, 8, 5 and the last divisor is 16. find the sum of two no's.

$16 \times 5 + 0 = 80$

$80 \times 8 + 16 = 656$

$656 \times 9 + 80 = 5984$

$5984 + 656 = 6640$ Ans

③ finding the HCF by long division method of two numbers the sequence of quotient from top to bottom is 2, 2 & 13 and the last divisor is 35. find both the numbers.

$35 \times (13) + 0 = 455$

$455 \times (2) + 35 = 945$

$945 \times (2) + 455 = 2345$

Two no's are 945 and 2345.

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④ Find HCF of 72 & 90.

2	72
2	36
2	18
3	9
	3

2	90
3	45
3	15
	5

HCF = $\underbrace{2 \times 3 \times 3}_{\text{common factors}} = 18$ Ans

OR

72 — 90

diff = 18 Ans.

HCF या तो diff होगा या diff. का factor.

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⑤ HCF of 48, 90, 120.

pick two numbers जिनके बीच का diff सबसे कम हो.
या तो diff HCF होगा या diff का factor.

48, 90, 120

30.

$30 = 2 \times 15$

3×10

$5 \times (6)$ — HCF

HCF = 6

⑥ 216, 423, 1215, 1422, 2169, 2223 . find HCF.

54 → diff.

$\frac{423}{27}$ (Not divide)

27 ✗

1 × ~~54~~

~~2~~ × ~~27~~

3 × ~~18~~

~~6~~ × (9) — HCF

HCF = 9.

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⑦ There are three prime numbers, the product of 1st two no. is 1891 and the product of last two no. is 7991. find all the numbers.

I × II = 1891] HCF = II

II × III = 7991]

1891 7991

6100

(61) × 100

HCF = 61

⑧ 3, 5, 7

3 × (5) = 15] HCF = (5)

(5) × 7 = 35]

w/c is 2nd no.

(100 या 100 के factor से ~~इनमें से~~ ~~कोई~~ no. divide नहीं होगा)

∴ 2nd no. = 61

1st no. = $\frac{1891}{61}$ = 31

3rd no. = $\frac{7991}{61}$ = 131

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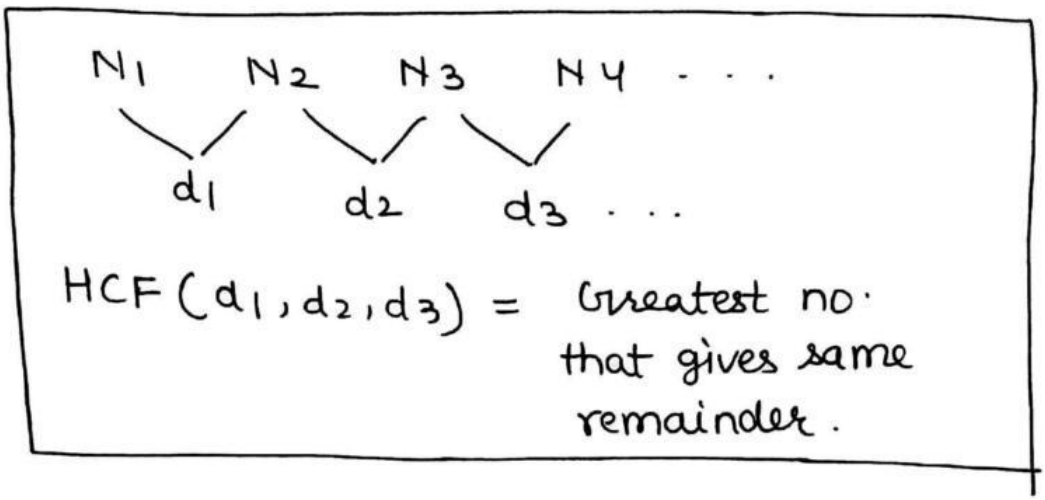
⑧ find the largest no. of two digit w/c when divided ~~by~~ to 211 and 396 gives same remainder.

वो no. हमेशा diff या diff का factor होगा।

211 396

diff = 185

⑨ find the greatest no. w/c when divided to 410, 751 and 1030 gives same remainder.



410 751 1030

341 279

HCF of 341 & 279

62

$\not{2} \times (31) \rightarrow$ HCF.

That no. is 31. Ans

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⑩ A farmer has 945 cows and 2475 buffallo. He wants to graze them in minimum no. of groups in such a way that each group has only one type of animal and also contains equal no. of animals in each group. find such minimum no. of groups.

⑪ A gardner has 44 apple tree, 66 banana tree and 110 mango tree. He want to plant them in rows such a way that each row contain only one type of plant and also has equal no. of plants. find no. of minimum row

(12) The area of three field are $288 cm^2$, $408 cm^2$, $552 cm^2$. Equal minimum size blocks are made in the field. If the width of each rectangular block is 4cm. find its length.

(13) Find the least no. of Equal size square tiles w|c can be fitted in a rectangular field whose sides are 284 m x 248 m.

Soln (10) HCF (945, 2475)

45

$\frac{945}{45} = 21$

$\frac{2475}{45} = 55$ ⇒ 76

OR

5	945
3	189
3	63
3	21
	7

5	2475
5	495
3	99
3	33
	11

HCF = 5 x 3 x 3 = 45

HCF के बाद जो बच गया वो group है।

7x3 + 5x11 = 76 Ans

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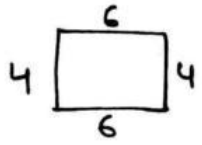
(11)

A	B	M
44	66	110
$\frac{44}{22} = 2$	$\frac{66}{22} = 3$	$\frac{110}{22} = 5$

HCF = 22

2+3+5 = 10 rows.

(12) (288 , 408 , 552) — HCF = 24 < 4 — width, 6 — length.



length = 6 cm Ans

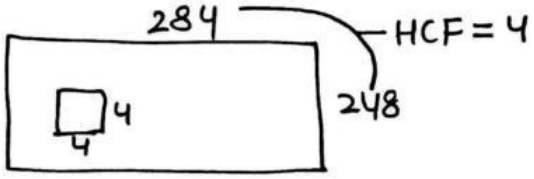
(*)

288 408 552

120 144

24 — HCF.

(13)



No. of tiles = $\frac{284 \times 248}{4 \times 4}$ = 4402 tiles.

(##) 20 , 25 , 35 , 40

5×2^2 , 5^2 , 5×7 , 5×2^3

HCF = $5^2 \times 2^3 \times 7$ = 1400.

(##)

LCM of fraction = $\frac{\text{LCM of Numerator}}{\text{HCF of Denominator}}$

HCF of fraction = $\frac{\text{HCF of numerator}}{\text{LCM of Denominator}}$

CLASS 47

(14) The ratio of two no is 3:4 and their LCM is 60. find their HCF.

HCF = x

3 : 4

3x : 4x

x x 3x4 = 60

$\boxed{x=5}$

NO's = 15, 20.

(15) The sum of two no. is 36 and their HCF is 4. find the possible no. of pairs.

HCF = 4

x : y

4x + 4y = 36

x+y = 9

(1, 8)

(2, 7)

(4, 5)

3 pairs are possible

(16) The LCM of 4 no's is 117 and the HCF of each pair is 3 find the multiplication of all the numbers.

HCF = 3

no's = 3a, 3b, 3c, 3d

LCM = 3abcd = 117

abcd = 39

81abcd = 81x39

(∵ 3x3x3x3 = 81)

Product of N no's

$(HCF)^{n-1} \times LCM$

or $(3)^3 \times 117$

$= 27 \times 117$

(7) The LCM and HCF of two consecutive even no's is 84 and 2. find the sum of reciprocal of these two no's.

HCF = 2

no's = 2a, 2b

LCM = 2ab

$2ab = 84$

$ab = 42$

6×7

a b

no's = 12, 14

sum of reciprocals = $\frac{1}{12} + \frac{1}{14}$ $\quad \frac{7+6}{84} = \frac{13}{84}$

6 8

2(3, 4)

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(18) The sum and LCM of two nos are 156 and 504. find both the numbers.

Sum = 156 LCM = 504

HCF = 12

The HCF of sum and LCM of two no's is also the HCF of these two nos

12 will also be the HCF of the two no's.

HCF = 12

nos = 12a, 12b

12a + 12b = 156

a + b = 13

LCM = 12ab = 504

$ab = 42$

$\therefore$ a = 6

b = 7

(19) The sum and LCM of two no' is 132 and 360 find two no's.

2	132
2	66
3	33
	11

2	360
2	180
2	90
3	45
3	15
	5

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

HCF of two no' = 12

let no's = $12a, 12b$

$12a + 12b = 132$

$12(a+b) = 132$

$\boxed{a+b = 11}$

LCM = $12ab = 360$

$\boxed{ab = 30}$

$a = 5$

$b = 6$ Ans.

(20) The HCF of two no's is 11 and their LCM 693. If one no' is 77. find the other number.

HCF = 11

LCM = 693

$\boxed{\text{LCM} \times \text{HCF} = \text{I} \times \text{II}}$

$^{9}\cancel{693} \times 11 = 77 \times \text{II}$

$\text{II} = 99$

(21) The LCM of two no' is 12 times of HCF. The sum of HCF and LCM is 403. if both no' are smaller than LCM. find both the number.

HCF = H

LCM = 12H

LCM + HCF = 403

$12H + H = 403$

$13H = 403$

$H = 31$

HCF = 31

LCM = $31 \times 12 = 372$

NO's are = $31x, 31y$

LCM = $31xy = 31 \times 12$

$xy = 12$

$(1, 12) \rightarrow (31\times1, 31\times12)$ ✗

$(3, 4) \rightarrow (31\times3, 31\times4)$ ✓

93, 124 Ans.

(22) The sum and diff. of HCF and LCM of two no. is 592 and 518. find both the numbers if sum of these two no' is 296.

$L + H = 592$

$L - H = 518$

$L = 555$

$H = 37$

No's = $37x, 37y$

LCM = $37xy = 555$

$xy = \frac{555}{37} = 15$

$37x + 37y = 296$

$x + y = 8$

$x = 5$

$y = 3$

No's = $37 \times 5 = 185$

$37 \times 3 = 111$

(23) find the smallest no. w/c when divided by 5, 6, 8 and 9 gives remainder 3 in each case.

5, 6, 8, 9

LCM = 360

smallest no. w/c gives 3 remainder when divided by 5, 6, 8, 9 = 360 + 3 = 363

(24) If a farmer ~~had~~ pack 5 or 6 oranges in each box, he is left with 3 oranges. But if he pack 8 or 9 oranges in each box, he is left with 3 oranges. find the no. of oranges that he had.

5, 6, 8, 9

LCM = 360

+ 3

363 — No. of oranges.

(25) Find the smallest no. w/c when divided by 20, 25, 35 and 40 gives remainder 14, 19, 29 and 34.

20, 25, 35, 40 LCM = 1400

$R \rightarrow \frac{-14}{6} \quad \frac{19}{6} \quad \frac{29}{6} \quad \frac{34}{6}$

1400
− 6
1394 Ans.

(26) Find the smallest no. w/c when divided by 5, 6, 7 & 8 gives remainder 3 in each case. but it exactly divided by 9

5, 6, 7, 8 LCM = 840

840 + 3
843 → But ये 9 से divide नहीं हो रही

840K + 3

837K + 3K + 3

↓ exactly divide by 9

↓ for what value of K it will divided by 9

$9 \overline{)840}\ 93$
81
30
27
3

$\Rightarrow K = 2$

$\therefore 840 \times 2 + 3 = 1683$ Ans.

(27) Find the smallest no. w/c when divided by 3, 4, 5 and 6 gives remainder 2, 3, 4 and 5. but exactly divide by 7.

3, 4, 5, 6 LCM = 60

$R \rightarrow \frac{-2}{1} \quad \frac{3}{1} \quad \frac{4}{1} \quad \frac{5}{1}$

60K − 1

4K − 1

K = 2

$7 \overline{)60}\ 8$
56
4

$\therefore 60 \times 2 - 1 = 119$ Ans.

(28) Find the least multiple of 13 w/c when divided by 3, 4, 5 and 6 gives remainder 1, 2, 3 and 4.

3, 4, 5, 6 LCM = 60

R→ 1 2 3 4

2 2 2 2

60K − 2

52K + 8K − 2

$13\overline{)60}$ 4, 52, 8

K = 1, 2, 3, 4, 5, 6, 7, 8, 9, (10)

for K = 10 it will divided by 13.

60K − 2

= 600 − 2 = 598 Ans.

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(29) Find the smallest no. of 6 digit w/c when divided by 3, 4, 5 and 6 gives remainder 2.

3, 4, 5, 6 LCM = 60

$60\overline{)100000}$ 1666

60

400

360

400

360

400

360

40

(20)

1,00000

+20

100020

+2

100022 Ans.

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(30) Find the largest no. of 6 digit w/c when divided by 3, 4, 5, 6 and 8 gives remainder 1, 2, 3, 4 and 6.

3, 4, 5, 6, 8 LCM = 120 $120\overline{)999999}$ 39

R→ 1 2 3 4 6

2 2 2 2 2

999999

−39

999960

−2

999958 Ans.

(31) ~~The~~ find the least perfect square no. w|c when divided by 4, 5, 6 gives remainder zero.

4, 5, 6 LCM = 60

$2 \times 2 \times 3 \times 5 \times (2) \times (5)$

Multiply by 3 & 5 to make pair

$60 \times 3 \times 5 = 900$

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(32) Two cog wheels having 16 and 24 teeth respectively The bigger wheel makes 5 revolutions per hour. Calculate how many times the specific teeth of bigger wheel meets with the specific teeth of smaller wheel in 11 hours.

(33) Three runners A, B and C run along a circular path of 12 Km long with speeds 3Km|Hr, 7Km|Hr, 13 Km|Hr. They start their race ~~to~~ from the same point for the same destination. After how much time they will meet again.

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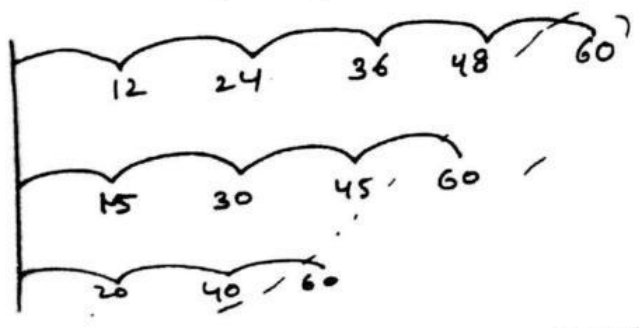
(34) 4 bells rings at an interval of 12 sec, 15 sec, 20 sec and 30 sec resp. How much time will they ring together in 6 Hours.

1st time they rang together.



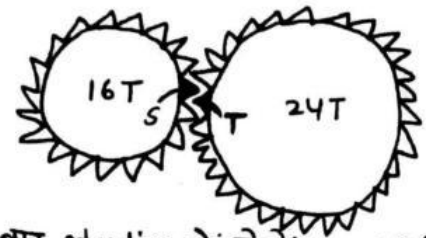
LCM of 12, 15, 20, 30 = 60

$\frac{6 \times \overset{60}{\cancel{3600}}}{\cancel{60}} = 360$

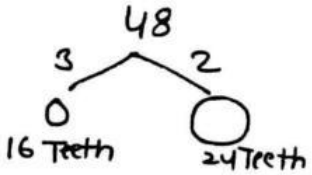
$+1$

361 times

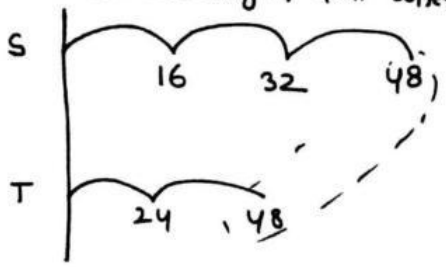
(32)



LCM of (16, 24) = 48



एक बार starting में दोनों wheel मिले हैं।



बड़ा wheel जब 2 चक्कर काटेगा तो वो एक बार छोटे wheel से मिलेगा (किसी specific teeth से)

Bigger wheel makes 5 revolutions per Hour

So in 11 Hours = 55 revolutions.

When Bigger wheel makes 2 revolutions it meets with the specific teeth of smaller wheel 1 time.

2 revolution ——— 1 time

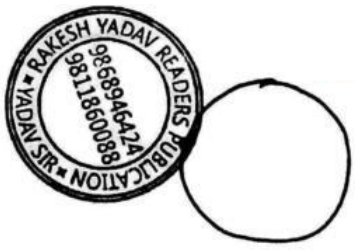
20 11 ——— 10 time

54 revolution ——— 27 time

27
+ 1 → start वाला
28 times Ans

(33)

A	B	C
12 Km	12 Km	12 Km
Time = 12/3	12/7	12/13



$$\text{LCM} = \frac{\text{LCM}(12,12,12)}{\text{HCF}(3,7,13)} = \frac{12}{1} = 12 \text{ Hrs}$$

After 12 Hours they will meet again.

Q: 32, 33, 34 – ऐसे Que. में Time का LCM लेते हैं।