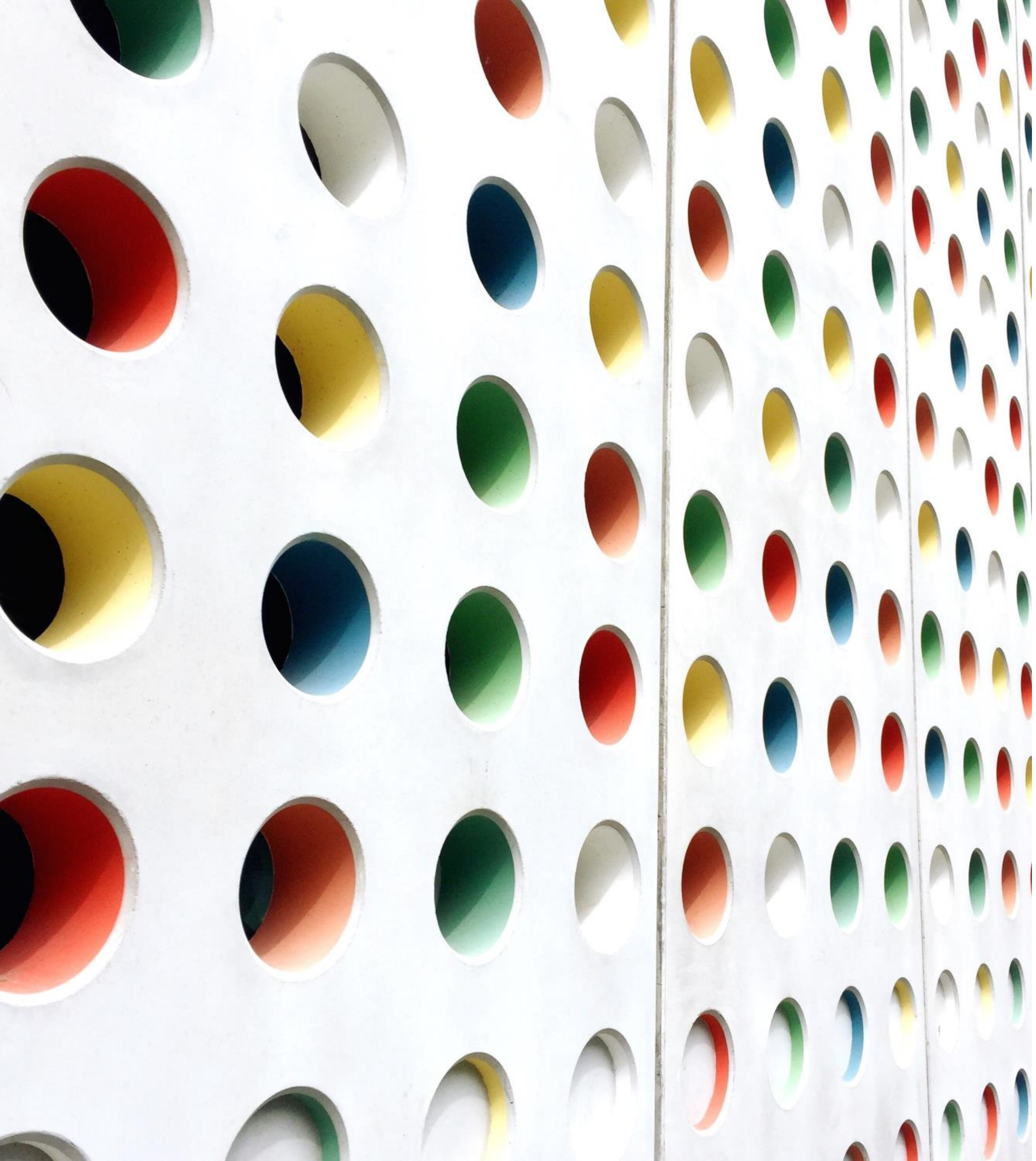

The Fundamental Theorem of Arithmetic

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Theorem 1.2 (Fundamental Theorem of Arithmetic) :Every composite number can be expressed (factorised) as a product of primes, and this factorization is unique, apart from the order in which the prime factors occur.

Composide :-

Prime no: 2, 3, 5, 7, 11, 13, 17, 19

L.C.M

Prime factorization

2	20
2	10
5	5
	1

2, 2, 5

2	86
43	43
	1

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

Express each number as a product of its prime factors: 3825, 7429

3	3825
3	1275
5	425
5	85
17	17
	17

$3825 = 3 \times 3 \times 5 \times 5 \times 17$

17	7429
19	437
23	23
	1

$\boxed{7429 = 17 \times 19 \times 23}$

Find the LCM and HCF of 6 and 20 by the prime factorization method.

$$\begin{array}{r|l} 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 20 \\ \hline 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$6 = 2 \times 3$

$20 = 2 \times 2 \times 5$

L.C.M

$\boxed{H.C.F = 2}$

Find the HCF and LCM of 6, 72 and 120, using the prime factorization method.

$$\begin{array}{r|l} 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 72 \\ \hline 2 & 34 \\ \hline 17 & 17 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 120 \\ \hline 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$6 = 2 \times 3$

$72 = 2 \times 2 \times 17$

$120 = 2 \times 2 \times 2 \times 3 \times 5$

H.C.F. = 2

Find the HCF of 96 and 404 by the prime factorization method. Hence, find their LCM.

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

2	404
2	202
101	101
	1

96 - 404

$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$

$404 = 2 \times 2 \times 101$

$H.C.F = 2 \times 2 = 4$

$(LCM) \times (HCF) = 96 \times 404$

$LCM = \dfrac{96 \times \cancel{404}^{101}}{\cancel{4}}$

$\boxed{LCM = 9696}$

$$\begin{array}{r} 101 \\ \times\ 96 \\ \hline 606 \\ 909\times \\ \hline 9696 \end{array}$$

Given that HCF (306, 657) = 9, find LCM (306, 657).

$$(LCM) \times (HCF) = 306 \times 657$$

$$LCM\,(9) = 306 \times 657$$

$$LCM = \frac{\cancel{306}^{\,102} \times \cancel{657}^{\,219}}{\cancel{9}\ \cancel{3}}$$

$$L.CM = 102 \times 219$$

$$\boxed{L.CM = 22\,338}$$

$$
\begin{array}{r}
219 \\
\times\ 102 \\
\hline
438 \\
000\times \\
219\times\times \\
\hline
22338
\end{array}
$$

Check whether 6^n can end with the digit 0 for any natural number n.

2×5

We know that if there is any number ends with zero. that mean that number is divisible by 2 and 5

∴ 2 and 5 is factor that number.

$6^n = (2 \times 3)^n$ (Here 5 is not the factor 6)

∴ there is no any value of (n) which can give us a number which is ending with 0.

∴ 6^n cannot end with the digit 0.

Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers

BODMAS

① , it say. Prime number

$7 \times 11 \times 13 + 13$

$(7 \times 11 \times 1 + 1) \times 13$

$(77 + 1) \times 13$

78×13

$2 \times 3 \times 13 \times 13$

42×24: 168, 84, 1008

$7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$

$(7 \times 6 \times 1 \times 4 + 3 \times 2 \times 1 + 1) \times 5$

$42 \times 24 + 1$

$1008 + 1 \times 5$

1009×5

There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?

2	18 - 12
2	9 - 6
3	9 - 3
3	3 - 1
	1 - 1

$L.C.M = 2 \times 2 \times 3 \times 3$
$= 4 \times 9 = 36$

$12 = 2 \times 2 \times 3$

$18 = 2 \times 3 \times 3$

$H.C.F = 2 \times 3 = 6$

$LCM \times HCF = 18 \times 12$

$LCM \times 6 = 18 \times 12$

$LCM = \frac{\cancel{18}^{3} \times 12}{\cancel{6}} = 3 \times 12 = 36$

36 min