# MISSION RIMC
# DEC 2022

## MATH

# LCM & HCF

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BY- SURAJ SIR

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# LCM & HCF

Highest common factor

Least common multiple

LCM(2, 3, 6) = 6

2 × 1 = 2
2 × 2 = 4
2 × 3 = 6
2 × 4 = 8
2 × 5 = 10
⋮

3 × 1 = 3
3 × 2 = 6
3 × 3 = 9

6 × 1 = 6
6 × 2 = 12
6 × 3 = 18
-

HCF

2 = 2 × 1
3 = 3 × 1
6 = 2 × 3 × 1

HCF(2, 3, 6) = 1

# Note

$N_1 = 3$

$N_2 = 12$

$N_1 \times N_2 = 36$

$LCM(3, 12) = 12$

$HCF(3, 12) = 3$

$LCM \times HCF = 12 \times 3 = 36$

$N_1 \times N_2 = LCM \times HCF$

# LCM of fraction $\left(\frac{p}{x}, \frac{q}{y}, \frac{r}{z}\right) = \frac{LCM(p,q,r)}{HCF(x,y,z)}$

# HCF of fraction $\left(\frac{p}{x}, \frac{q}{y}, \frac{r}{z}\right) = \frac{HCF(p,q,r)}{LCM(x,y,z)}$

eg $\left(\frac{2}{5}, \frac{3}{7}, \frac{4}{9}\right)$ → LCM & HCF

LCM: $\frac{12}{1} = 12$

HCF: $= \frac{1}{315}$

The LCM of two numbers is 28 times of their HCF. The sum of their LCM & HCF is 1740. If one of the no: is 240. Find the other no:

Sol)

Given

$LCM = 28 \times HCF \rightarrow (1)$

$LCM + HCF = 1740 \rightarrow (2)$

$N_1 = 240, N_2 = ?$

$N_1 \times N_2 = LCM \times HCF$

Put value of (1) in (2)

$28HCF + HCF = 1740$

$29HCF = 1740$

$HCF = \frac{1740}{29} = 60$

$LCM = 28 \times 60 = 1680$

$240 \times N_2 = 1680 \times 60$

$N_2 = \frac{1680 \times 60}{240}$

420

4

$N_2 = 420$

Note: 1. The greatest no: that will divide x, y & z leaving remainders a, b & c respectively is given by the HCF of (x-a), (y-b), (z-c). 2. The greatest no: that will divide x, y & z leaving the same remainder in each case is given by the HCF of (x-y), (y-z), (z-x)

HCF $(x-y)$, $(y-z)$, $(z-x)$

3. The least no: which when divided by x, y & z leaves same remainder R in each case is given by the LCM of (x,y,z) + R

Eg: Find the least no: which when divided by 12, 16, 18, 30 leaves remainder 4 in each case but it is completely divisible by 7

Sol) As we know

$LCM(12,16,18,30) = 720$

In order to get remainder 4

$= 720 \times n + 4$

for the value $n = 4$

$720 \times 4 + 4$

$4[720 + 1]$

$\frac{4 \times 721}{7}$

$720 \times n + 4$

① $720 \times 1 + 4 =$ ✗

$720 \times 2 + 4 =$ ✗

$720 \times 3 + 4 =$ ✗

$720 \times 4 + 4$ ✓

for $n = 4$

$720 \times 4 + 4 = 2884$

Eg: Find the least no: which when divided by 3, 5, 6, 8, 10 & 12 leaves remainder 2 in each case but it is completely divisible by 13

962

Sol)

$$LCM\,of(3,5,6,8,10,12) = 120 + 2$$

$$\frac{120 \times n + 2}{13}$$

$$\frac{117n + 3n + 2}{13}$$

$$\Rightarrow \frac{117n}{13} + \frac{3n+2}{13}$$

$$\frac{3n+2}{13} \overset{n=8}{=} \frac{26}{13} = 2$$

$$120n + 2$$

$$120 \times 8 + 2 = 962$$

4. The least no: which when divided by x, y & z leaves the remainder a, b & c respectively is given by the LCM of (x,y,z) - p where p= (x-a) = (y-b) = (z-c)

The least no which when divided by x, y, z

LCM(x,y,z) - p

What is the least no: which when divided by 15, 18 & 21 leaves remained 2, 5 & 8 respectively

Sol)

$$p = (15-2) = (18-5) = (21-8) = 13$$

$$L.C.M(15, 18, 21) - p$$

$$= 630 - 13$$

$$= 617 \text{ m}$$

18 & 21 leaves remainder 2, 5, 8 respectively?

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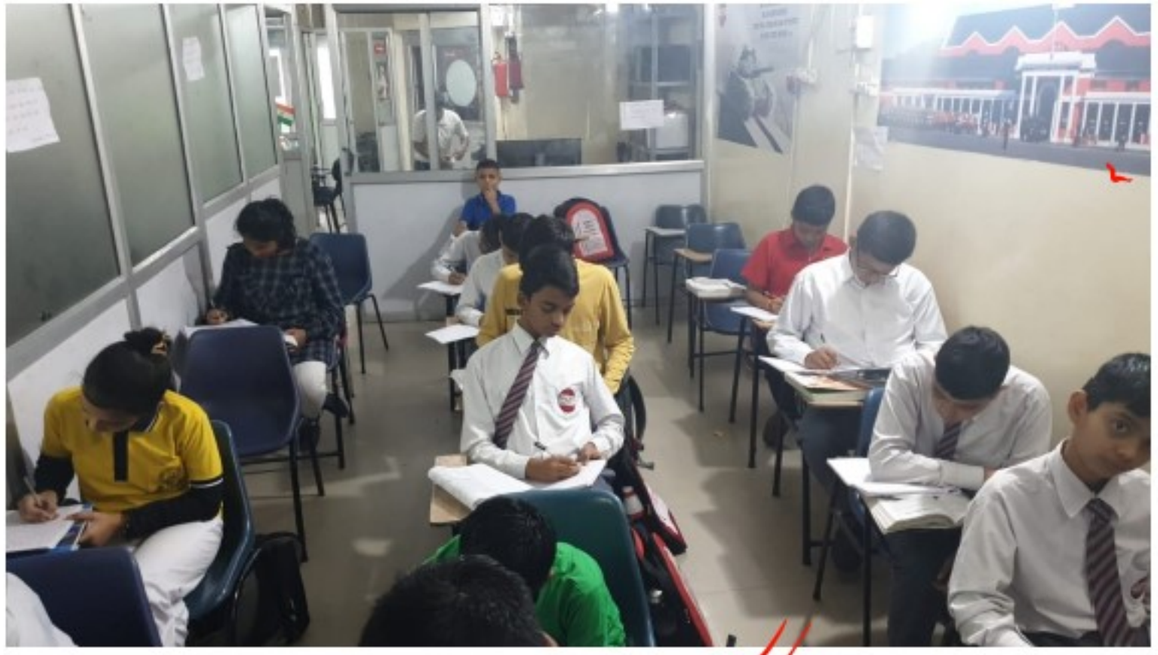


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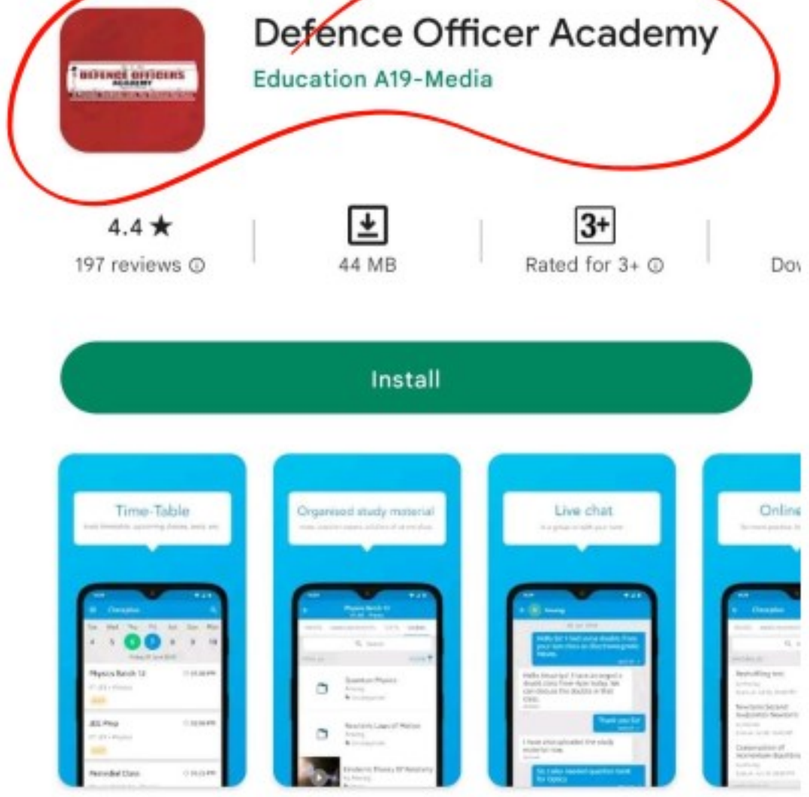


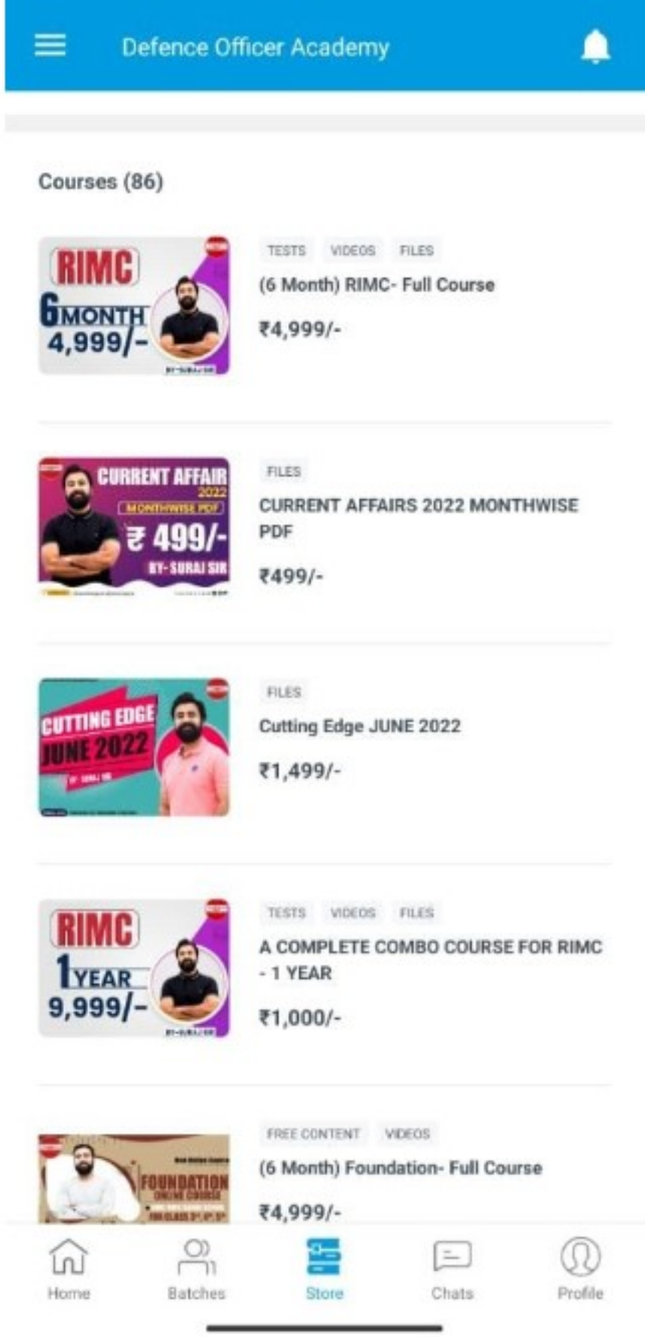

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