RPF SI & CONSTABLE 2024

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MATHS

Remainder Theorem

Part -3



LIVE STREAMING 08-05-2024 9AM

How to shorten the base
Base को छोटा करना →

Base ⇒ 102

$2^5 = 32$

$2 \times 2 \times 2 \times 2 \times 2$

$\frac{102^5}{10}$, R = ? $\frac{2^5}{10} \Rightarrow \frac{32}{10} \Rightarrow 2$

$\Rightarrow \frac{(100+2)^5}{10}$,

$4 \equiv$ $4 \equiv$ $4 \equiv$ $4 \equiv$

$9235!$ $9235!$ $2359!$ $9999!$

Q. $8888 + 2222 + 6666 + 9999$ का U.D=?

$8 \times 8 \times 8 \times 8$

64×64

(6)

$8^4 + 2^4 + 6^4 + 9^4$

$\downarrow \quad \downarrow$

$\rightarrow 6 + 6 + 6 + 1$

$\Rightarrow$ 9 (U.D) Ans

क्रमगुणित

* Factorial 3 से बड़े सभी factorials 4 से divisible होते हैं

$0 = 0! = 1$

$1 = 0! = 1$

$2 = 2! = 2 \times 1 = 2$

$3 = 3! = 3 \times 2 \times 1 = 6$

$4 = 4! = 4 \times 3 \times 2 \times 1 = 24$

8^{27} का U.D = ?

4) 24 (6
24
3 Rem

$8^3 \Rightarrow 512$

3^{32} का U.D. = ?

4) 32 (8
32
0
×

$3^4 \Rightarrow 81$

U.D = 1

Fermat theorem:-

Power को छोटा ← करना
(To shorten the power)

अभाज्य संख्या
Prime Number

$$\frac{a^{p-1}}{p} \Rightarrow R = 1$$

→ जहाँ P → अभाज्य संख्या (Prime No.)

a, p → सह अभाज्य संख्या (Co-Prime No.)

HCF = 1

kapil

कपिल

Fermat No. → "अभाज्य संख्या" की Fermat No. उस संख्या से 1 कम होता है

(Fermat No. of a prime No is one less than that prime No.)

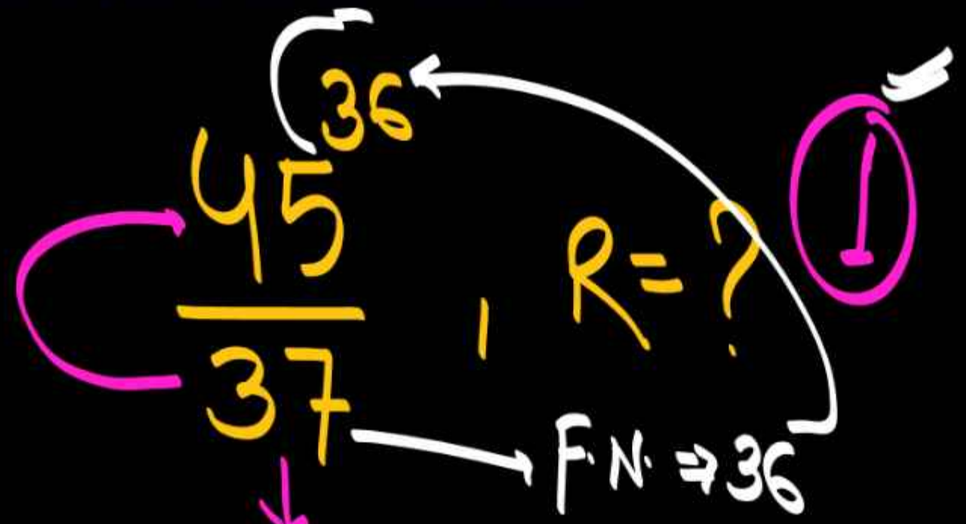
101 → 100

अभाज्य संख्या →	Fermat No.
2 →	1
3 →	2
5 →	4
7 →	6
11 →	10
23 →	22
89 →	88
37 →	36

power को छोटा करने के लिए Fermat No से power में भाग दिया जाता है

Find the Remainder:

1. $\frac{45^{36}}{37}$

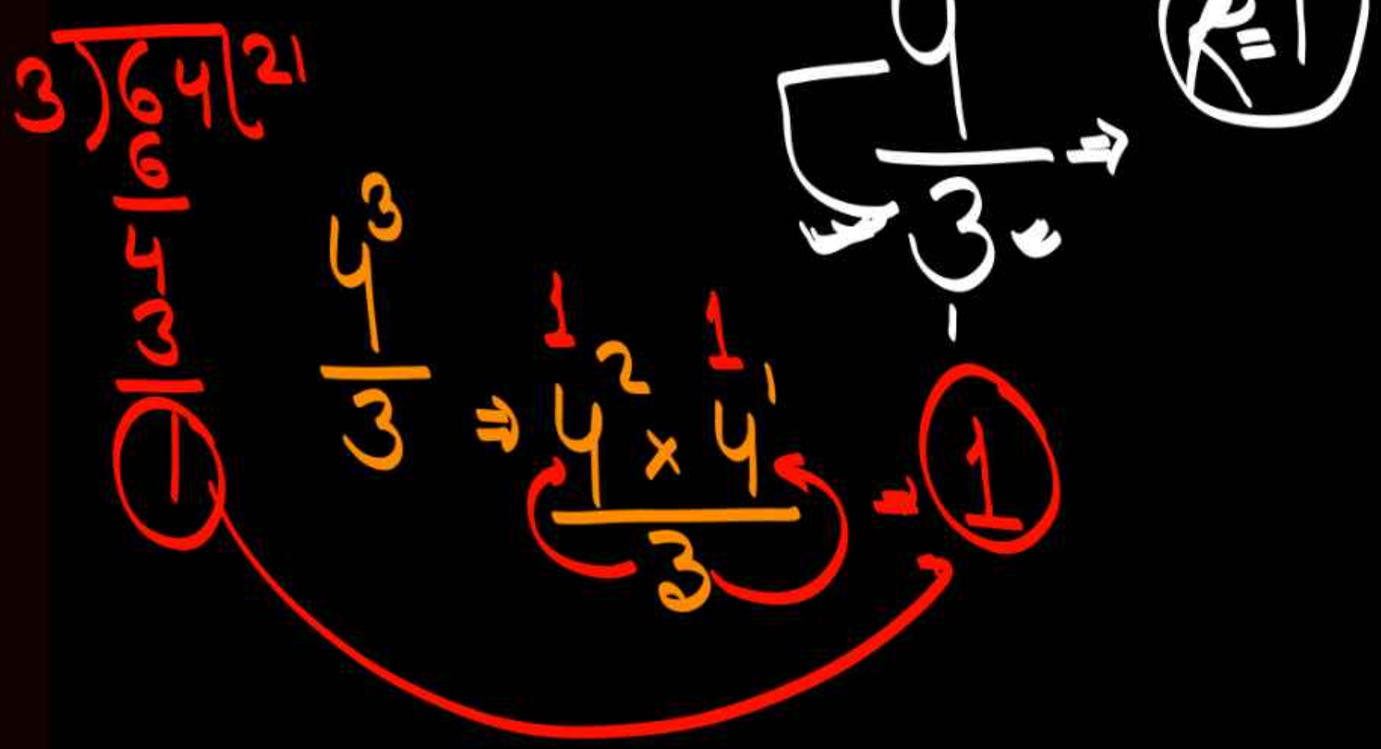


$$\frac{a^{p-1}}{p} = R = 1$$

37, 45

HCF = 1

2. $\frac{4^2}{3}$





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

3. $\frac{37^{28}}{29}$

$\frac{37^{28}}{29} \Rightarrow R = 1$

Co prime

29 = अभाज्य सं.

$\frac{37^{29}}{29}$, R = ?

$\frac{37^{28} \times 37^{1}}{29}$

1 × 8

R = 8

4. $\frac{94^{88}}{87}$, R = 1

अभाज्य

$\frac{94^{89}}{87}$, R = ?

$94^{88} \times 94$

1 × 5

Find the Remainder:

5. $\frac{45^{216}}{37}$

$36 \times 6 = 216$

$\frac{45^{216}}{37}$

$\frac{(45^{36})^6}{37}$

$1^6 = 1$

$R = 1$

Compulsory शर्त

Divisor (हर) ⇒ Prime No. (अभाज्य No.)

अंश व हर → Co-prime

$\frac{45^{217}}{37} = \frac{45^{216} \times 45^1}{37}$

$1 \times 8 = 8$

6. $\frac{37^{280}}{29}$

Co-prime $\left[\frac{37^{280}}{29}, R=?\right]$ → अभाज्य

$\frac{37^{28}}{29} = R=1$

$\rightarrow (a^n)^m = a^{n\times m}$

$\frac{37^{28\times 10}}{29} \rightarrow \frac{1^{10}}{}$

$R=1$

$\frac{37^{28\times 9}}{29}$

$\frac{37^{28\times 8}}{29}$

$\frac{37^{28}}{29}, R=?$

$\frac{37^{28\times 9}\times 37^{28}}{29}$

7.

$\frac{94^{481}}{87}$, R = ?

$\frac{94^{88}}{87}$, R = 1

$= \frac{94^{480} \times 94^{1}}{87}$

$= \frac{(94^{480} \times 94)}{87}$ $= \frac{1 \times 94}{87}$ $= \frac{7}{R}$

8. $\frac{4^{25}}{3}$

$1^{25} = 1$

$\frac{4^{25}}{3}$, R = ?

$\frac{4^2}{3}$ = R = 1 →

$\frac{4^{24} \times 4^1}{3}$

$\frac{(4^2)^{12} \times 4^1}{3}$ → 1

10. $\frac{25^{1601}}{17}$ का शेषफल क्या होगा?

What will be the remainder of $\frac{25^{1601}}{17}$?

a. 16
b. 8
c. 11
d. 17