शेषफल प्रमेय
Remainder Theorem

$2 + 2 \Rightarrow 4$

$\frac{12 + 17}{5}$, R = ?

$5\overline{)29}\,(5$
$\underline{25}$
4

$\frac{29}{5}$, R = 4

शेषफल हमेशा भाजक से छोटा होता है।
The Remainder is always less than divisor.

छोटा

$1 + 2 + 3 + 4 \Rightarrow 10$

$\frac{20 + 21 + 22 + 23}{19}$, R = ?

R = 10

Q. The Remainder when $75 \times 73 \times 78 \times 76$ is divided by 34 is:-
$75 \times 73 \times 78 \times 76$ को 34 से विभाजित करने पर प्राप्त शेषफल ज्ञात करें।

$\frac{7 \times 5 \times 10 \times 8}{75 \times 73 \times 78 \times 76} \Rightarrow \frac{1 \times 12}{35 \times 80} \Rightarrow \frac{35 \times 80}{34} \Rightarrow 12$

Q. $\frac{1 \times 2 \times 3 \times 4}{21 \times 22 \times 23 \times 24}$, R = ? $\frac{24}{10} \Rightarrow 4$

10 से छोटा

R ⟶ Less than 10

Q. $\frac{4 \times 4 \times 2 \times 1}{37 \times 48 \times 68 \times 100}$, R = ? $\frac{32}{11} \Rightarrow 10 \rightarrow R$

Q. $\frac{1 \times 1 \times 1 \times 1 \times 1 \Rightarrow 1}{25 \times 25 \times 25 \times 25 \times 25}$, R = ?
12

Q. $\frac{(40)^{412}}{13}$, R = ?

412
1

1.

$40^4 \Rightarrow 40 \times 40 \times 40 \times 40$

1. $\frac{(104)^{25}}{51}$, R = ? $51 \times 2 \Rightarrow 102$

$\Rightarrow \frac{2^5}{51} \Rightarrow \frac{32}{51}$ · छोटा है।

R = 32

2. $\frac{(121)^{24}}{17}$, R = ?

$\frac{2^4}{17} \Rightarrow \frac{16}{17}$ · R = 16

1. $\frac{204^5}{50}$, R = ?

$\frac{4 \times 4 \times 4 \times 4 \times 4}{50}$ (256)

$\frac{(200+4)^5}{50} \Rightarrow \frac{4}{50} \Rightarrow \frac{1024}{50}$ = R = 24

2. $\frac{(174)^5}{19}$, R = ?

$\frac{(171+3)^5}{19} \Rightarrow \frac{3^5}{19}$

R = 15

19)243(12
19
53
38
15

If the numerator is less than denominator than the numerator is Remainder in itself.

यदि अंश, हर से छोटा है तो वही अंश Remainder होगा।

Binomial Theorem (द्विपद प्रमेय)

$\frac{(x+a)^k}{x} = \frac{a^k}{n}$ (R)

$\Rightarrow \frac{(201)^{401}}{200}$, R = ?

$\frac{(200+1)^{401}}{200} \Rightarrow \frac{1^{401}}{200} \Rightarrow 1$

Negative Remainder. (ऋणात्मक शेषफल) :-

$\frac{17}{6}$, R = ? (+5) $\xrightarrow{-1}$ 6 − 1 ⇒ 5

Remainder का Answer कभी भी negative नहीं होगा।

$\frac{25^{-2}}{5} = 5-2 \Rightarrow 3 = R$

$5\overline{)23}(4$
$\underline{20}$
3

① $\frac{(401)^{302}}{402}$ या $R = ?$

$(-1)^{302}$

1

② $\frac{(401)^{302}}{400}$ $R = ?$

1^{302}

1

$(-1)^{even} \longrightarrow +1$

$(-1)^{odd} \longrightarrow -1$

① $\frac{6^2}{7}$, $R = ?$

$(-1)^2$

$R = 1$

$7\overline{)36}(5$
$\underline{35}$
1 (शेषफल)

② $\frac{6^2}{5}$, $R = ?$

1^2

$R = 1$

$5\overline{)36}(7$
$\underline{35}$
$1.$

① $\frac{(509)^{509}}{510}$, $R = ?$

$(-1)^{509}$

$\frac{-1}{510}$ $\quad 510 - 1 = 509$

$R = 509$

② $\frac{(509)^{509}}{508}$, $R = ?$

1^{509}

$R = 1$

Q. $\frac{97 \times 98 \times 101 \times 103}{100}$, $R = ?$

$-3 \times -2 \times -1 \times 3$

$+6 \times 3 \Rightarrow 18$

$R = 18$

Minus × minus = plus

$(-) \times (-) = (+)$

Q. $\frac{47 \times 48 \times 49 \times 51 \times 52}{50}$, $R = ?$

$-3 \times -2 \times -1 \times 1 \times 2$

$+6 \times -1 \times 2$

$\Rightarrow \frac{-12}{50} \Rightarrow 50 - 12 \Rightarrow 38 = R$

Q. The Remainder when $72 \times 73 \times 78 \times 76$ is divided by 35 is :-
$72 \times 73 \times 78 \times 76$ को 35 से विभाजित करने पर शेषफल है।

$$\Rightarrow \frac{(72 \times 73 \times 78 \times 76)}{35}$$

$$\Rightarrow \frac{(2 \times 3 \times 8 \times 6)}{35}$$

$$\Rightarrow \frac{288}{35}$$

$$\Rightarrow \frac{8}{35} \Rightarrow 8 = R$$