

01.

Find no of zero when multiplay first 50 prime number.

प्रथम 50 अभाज्य संख्याओं के गुणनफल के अंत में कितने शून्य  
होगे।

(a) 1

(b) 10

(c) 15

(d) 20

$3 \times 5 \times 7 \times 11 \times 13 \dots$   
= एक ही शून्य नहीं  
होगा

$2 \times 3 \times 5 \times 7 \times 11 \times 13 \times 17 \times 19 \times 23 \dots$

$2^1 \times 5^1 \rightarrow \text{pair} = 1$

No. of zero = 1



02.

Find the number of zeros at the end the product.

शून्यकों की संख्या ज्ञात कीजिये।

$$12 \times 5 \times 15 \times 24 \times \cancel{13} \times 30 \times 75$$

(a) 4

(b) 5

(c) 2

(d) 3

$$\cancel{2} \times \cancel{2} \times 3$$

$$\cancel{5}$$

$$\cancel{3} \times \cancel{5}$$

$$\cancel{2} \times \cancel{2} \times \cancel{2} \times 3$$

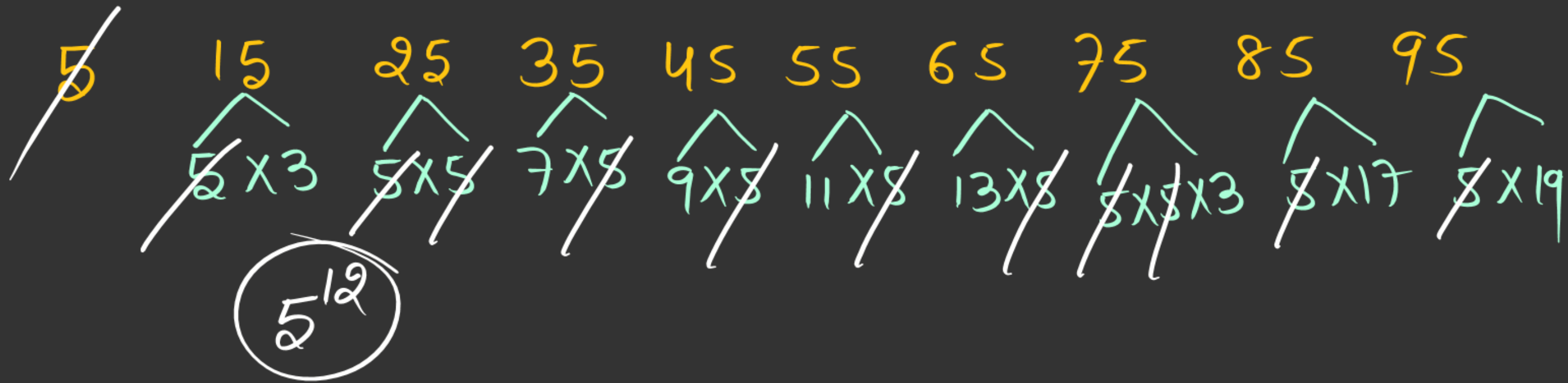
$$\cancel{2} \times \cancel{3} \times \cancel{5}$$

$$\cancel{5} \times \cancel{2} \times 3$$

$$2^6 \times 5^5 \rightarrow \text{pair} = 5$$

## विषम सं० (odd no.)

$(1 \times 3 \times 5 \times 7 \times 9 \times 11 \dots \dots \dots \times 99)$  के अंत में शून्यों की सं० निकालें  
↳ एक भी शून्य नहीं होगा।



03.

Find the maximum number of zero at this product.

गुणनफल के अंत में कितने शून्य होंगे।

$$1 \times 3 \times 5 \times 7 \times 9 \dots\dots\dots 101 \times 128$$

(a) 0

~~(b) 7~~

(c) 5

(d) 6

128 → 27

$$(1 \times 3 \times 5 \times 7 \times 9 \times \dots \times 101) \times 128$$

$$\Downarrow$$

$$5^{12}$$

$$\Downarrow$$

$$2^7$$

$$5^{12} \times 2^7 \rightarrow 7 \text{ pair}$$

$$\begin{array}{r|l} 2 & 128 \\ \hline 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \end{array}$$



04.

Find number of zeros at the end of the expression.

शून्यकों की संख्या ज्ञात करें।

$$10^1 + 10^2 + 10^3 + \dots + 10^8$$

(a) 8

(b) 28

(c) 0

~~(d) 1~~ (e) 14

Smallest power

सबसे छोटा घात

$$\begin{array}{l} 10^1 = 10 \\ 10^2 = 100 \\ \hline 110 \end{array}$$

$$\begin{array}{l} 10^1 + 10^2 \\ \hline 110 \end{array}$$

$$\# 10^9 + 10^8 + 10^7 + 10^{12}$$

$$\text{no. of zero} = 7$$

$$10^2 + 10^3 + 10^4$$

$$\begin{array}{r} 100 \\ + 10000 \\ + 100000 \\ \hline 110100 \end{array}$$

$$10^{24} + 10^{39} - 10^{29} + 10^{\textcircled{23}} + 10^{33}$$

$$\text{no. of zero} = 23$$

05.

Find number of zeros in the end of  $1^3 \times 2^4 \times 3^5 \dots\dots 26^{28}$

$1^3 \times 2^4 \times 3^5 \dots\dots 26^{28}$  के अंत में शून्यकों की संख्या क्या होगी।

(a) 100

(b) 112

(c) 125

(d) 128



06.

Find number of zeros in the end of  $1^{20} \times 2^{20} \times 3^{20} \times 4^{20} \times$   
.....  $38^{20}$ .

$1^{20} \times 2^{20} \times 3^{20} \times 4^{20} \times$  .....  $38^{20}$  के अंत में शून्यों की संख्या क्या होगी।

- (a) 160      (b) 180      (c) 150      (d) 120



07.

The number 2, 4, 6, 8 .....98, 100 are multiplied together.

The number of zeros of at the end of the product mus be.

संख्या 2, 4, 6, 8 .....98, 100 का परस्पर गुणा किया जाता है तो गुणनफल के अंत में शून्य की संख्या कितनी होगी।

(a) 10

(b) 12

(c) 14

(d) 18

$$2 \times 4 \times 6 \times 8 \times 10 \times \dots \times 98 \times 100 = 50$$

$$\frac{50}{5} = 10$$



$$\textcircled{\text{I}} \quad 2 \times 4 \times 6 \times 8 \times \dots \times \frac{200}{2} = 100 \xrightarrow{\text{Proof zero}} \textcircled{24}$$

$$\textcircled{\text{II}} \quad 3 \times 6 \times 9 \times 12 \times \dots \times \frac{900}{3} = 300 \rightarrow \textcircled{74}$$

$$\textcircled{\text{III}} \quad 7 \times 14 \times 21 \times 28 \times \dots \times \frac{700}{7} = 100 \rightarrow \textcircled{24}$$

$$\textcircled{\text{IV}} \quad 9 \times 18 \times 27 \times 36 \times \dots \times \frac{3600}{9} = 400 \rightarrow \textcircled{99}$$

$$\begin{aligned} \frac{400}{2} &= 80 \\ \frac{80}{2} &= 16 \\ \frac{16}{2} &= 8 \\ \frac{8}{2} &= 4 \\ \frac{4}{2} &= 2 \\ \frac{2}{2} &= 1 \end{aligned} \quad \textcircled{99}$$

$$\begin{aligned} \frac{300}{5} &= 60 \\ \frac{60}{5} &= 12 \\ \frac{12}{3} &= 4 \\ \frac{4}{2} &= 2 \\ \frac{2}{2} &= 1 \end{aligned} \quad \textcircled{74}$$

$$\textcircled{\text{VI}} \quad 5 \times 10 \times 15 \times 20 \times \dots \times \frac{100}{5} = 20$$

$$\frac{20}{2} = 10 \checkmark$$

$$\frac{10}{2} = 5 \checkmark$$

$$\frac{5}{2} = 2 \checkmark$$

$$\frac{2}{2} = 1 \checkmark$$

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$\textcircled{18}$

08.

Find the number of zeros.

शून्यकों की संख्या ज्ञात करें।

$$10! + 20! + 30!$$

- (a) 2                      (b) 4                      (c) 6                      (d) 12

$$10! + \cancel{20!} + \cancel{30!}$$

$$\lfloor 10 \rfloor \rightarrow \frac{10}{5} = 2 \checkmark$$

$$10^5 + 10^{\textcircled{4}} + 10^8$$

No. of zero  $\rightarrow 4$

$$\lfloor \frac{2000}{5} \rfloor + \lfloor \frac{3000}{5} \rfloor + \lfloor \frac{5000}{5} \rfloor + \lfloor \frac{6000}{5} \rfloor \quad \text{शून्यों की सं०}$$

$$\begin{aligned} 2000! &\rightarrow \frac{2000}{5} = 400 \checkmark \\ &\frac{400}{5} = 80 \checkmark \\ &\frac{80}{5} = 16 \checkmark \\ &\hline &\quad \quad \quad (16) \end{aligned}$$

$$\textcircled{1} \quad \lfloor 10 \rfloor \times \lfloor 20 \rfloor$$

$$10^2 \times 10^4 = 10^6$$

no. of zero = 6

$$10! \rightarrow \frac{10}{5} = \textcircled{2}$$

$$20! \rightarrow \frac{20}{5} = \textcircled{4}$$

yes/no

$$\lfloor \frac{10}{5} \rfloor \times \lfloor \frac{20}{5} \rfloor \rightarrow 6 \checkmark$$

$$a^m \times a^n = a^{m+n}$$
$$\frac{a^m}{a^n} = a^{m-n}$$

$$\# \quad \textcircled{24} \quad \textcircled{49} \\ 100! \times 200! \longrightarrow 24 + 49 = \textcircled{73}$$

$$\# \quad \sqrt{60} \times \sqrt{80} \times \sqrt{50} \\ \textcircled{14} + \textcircled{19} + \textcircled{12} = \textcircled{45}$$

$$\sqrt{100} \rightarrow \frac{100}{5} = 20$$

$$\frac{20}{5} = 4 \\ \hline 24$$

$$\sqrt{200} \rightarrow \frac{200}{5} = 40$$

$$\frac{40}{5} = 8$$

$$\frac{8}{5} = +1 \\ \hline 49$$

$$\sqrt{60} \rightarrow \frac{60}{5} = 12 \\ \frac{12}{5} = 2 \\ \hline \textcircled{14}$$

$$\frac{50}{5} = 10$$

$$\frac{10}{5} = +2 \\ \hline \textcircled{12}$$

$$\sqrt{80} \rightarrow \frac{80}{5} = 16 \\ \frac{16}{5} = 3 \\ \hline 19$$

$$\textcircled{i} \quad \frac{\sqrt{200} \rightarrow \textcircled{49}}{\sqrt{100} \rightarrow \textcircled{24}}$$

$$\text{no. of zero} \rightarrow 49 - 24 = 25$$

$$\textcircled{ii} \quad \frac{\sqrt{90} \rightarrow \textcircled{21}}{\sqrt{40} \rightarrow \textcircled{9}} \rightarrow \underline{\underline{21 - 9 = \textcircled{12}}}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$\frac{90}{25} = 18$$

$$\frac{18}{5} = \frac{3}{2}$$

$$\frac{40}{5} = 8$$

$$\frac{8}{5} = \frac{1}{5}$$

~~$\infty$~~  +, -  $\rightarrow$  સર્વપ્રદેશીય power  $\gamma$

~~$\infty$~~   $\times$   $\rightarrow$

~~$\infty$~~   $\div$   $\rightarrow$

09.

Find number of zeros at the end of the given expression.

शून्यकों की संख्या ज्ञात करें।

$$(8^{123} - 8^{122} - 8^{121}) (3^{223} - 3^{222} - 3^{221})$$

(a) 1

(b) 2

(c) 0

(d) 3



10.

How many zero will be at the end of the expression.

शून्यकों की संख्या ज्ञात करें।

$$\frac{41! \rightarrow 9}{12! \rightarrow 2} \rightarrow 9 - 2 = 7$$

(a) 8

(b) 7

(c) 6

(d) 4

$$\lfloor \frac{41}{5} \rfloor = 8$$

$$\lfloor \frac{8}{5} \rfloor = 1$$

$$\text{Total} = 9$$

$$\lfloor \frac{41}{5} \rfloor \times \lfloor \frac{41}{25} \rfloor$$

$$8 + 2 = 10$$

11.

Find the number of highest power of 7 in 777!

777! में 7 की उच्चतम घात संख्या ज्ञात कीजिये।

(a) 128

(b) 130

(c) 126

(d) 125

$$\frac{777}{7} = 111 \checkmark$$

$$\frac{111}{7} = 15 \checkmark$$

$$\frac{15}{7} = 2 \checkmark$$

128



12.

Find the number of zeros at the end of  $101!$

101! में शून्यकों की संख्या ज्ञात कीजिये।

(a) 20

(b) 22

~~(c) 24~~

(d) 25

$$\frac{101}{5} = 20$$

$$\frac{20}{5} = 4$$

13.

Find the highest power of 5 in 100!

100! में 5 की अधिकतम घात बताओं।

(a) 23

(b) 48

(c) 24

(d) 11

$$\frac{100}{5} = 20$$
$$\frac{20}{5} = 4$$

14.

Find maximum power of 70 in 7000!

7000! में 70 की अधिकतम घात बताओं।

(a) 1213

(b) 1164

(c) 1203

(d) 1102

$$70 \rightarrow 2^1 \times 5^1 \times 7^1$$

$$\begin{aligned} \frac{7000}{7} &= 1000 \\ \frac{1000}{7} &= 142 \\ \frac{142}{7} &= 20 \\ \frac{20}{7} &= 2 \end{aligned}$$

1164

$$\sqrt[3]{300}$$
$$15^n$$

n का अधिक मान निकालें।

$$n = 74$$

$$15 \rightarrow 3 \times 5$$

$$\sqrt[3]{300}$$

$$\rightarrow \frac{300}{5} = 60 \checkmark$$

$$\frac{60}{5} = 12 \checkmark$$

$$\frac{12}{5} = 2 \checkmark$$

$$74$$