

## UNIT DIGIT & FACTOR

↓  
 Last digit

Eg:  $123456$

1. Addition:

$$5679 + 3287 + 1432$$

$$[9 + 7 + 2]$$

$$18 \rightarrow \text{unit digit } 8$$

2. Subtraction

$$2383 - 1222$$

$$3 - 2$$

$$= 1$$

$$2383 - 1689$$

$$13 - 9$$

$$4$$

3. Multiplication

$$232 \times 235$$

$$2 \times 5$$

$$10 \rightarrow \text{unit digit } = 0$$

4. Power :  $16^2 = 256$   
 unit digit - 6

$$(529)^{321} = P$$



0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Type-1 [0, 1, 5, 6]

$0^n = 0$

$1^n = 1$

$5^n = 5$

$6^n = 6$

Eg:  $1^2 = 1$ ,  $1^3 = 1$

$11^2 = 121$ ,  $11^3 = 1331$

$(725)^{6253} = ?$

unit digit  $\rightarrow 5$

Type-2 [4, 9]

Power  $\rightarrow$  even / odd

$4^1 = 4$   $\leftarrow 4^{(odd)} = 4$

$4^2 = 16$   $\leftarrow 4^{(even)} = 6$

$4^3 = 64$   $\leftarrow 4^{(odd)} = 4$

$9^{(odd)} = 9$

$\rightarrow 9^1 = 9$

$9^{(even)} = 1$

$\rightarrow 9^2 = 81$

$9^3 = 729$

$(529)^{321} = \text{odd}$

unit digit  $\rightarrow 9$

Type-3 (2, 3, 7, 8)

Power  $\div 4$



$(187)^{282}$

$= 7^2$

$= 49$

$4 \overline{) 282}$   
 $\underline{28}$   
 $02$



$$1. (147)^{282} \times (529)^{321} \times (343)^{236}$$

$$7^{282} \times 9^{321} \times 3^{236}$$

(Type 3)                      (Type 2)                      (Type 3)

$$7^2 \times 9 \times 3^4$$

$$49 \times 9 \times 81$$

$$9 \times 9 \times 1$$

$$4 \overline{) 262}$$

$$\underline{28}$$

$$2$$

$$4 \overline{) 236}$$

$$\underline{20}$$

$$36$$

$$\underline{36}$$

$$0$$

80  
 ↳ unit digit

$$2. (789)^{315} + (232)^{644} + (528)^{253}$$

$$9 + 2^4 + 8^1$$

$$9 + 16 + 8$$

$$33$$

=  
 ↳ unit digit

$$\frac{644}{4} = 0$$

$$4$$

$$+ \frac{253}{13}$$

$$\underline{24}$$

$$13$$

$$12$$

$$\underline{1}$$

$$3. (982)^{981} - (219)^{241}$$

$$2^1 - 9$$

$$12 - 9$$

$$3 //$$

$$9 \overline{) 219}$$

$$\underline{219}$$

$$4 \overline{) 481}$$

$$\underline{4}$$

$$8$$

$$\underline{8}$$

$$1$$

$$4. 71 \times 72 \times 73 \times 74 \times 75 \times 76 \times 77 \times 78 \times 79$$

$$1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9$$

10  
 ↳ unit digit = 0

$$\frac{10 \times 42}{42} = 0$$



Factor  $2^a \times 3^b \times 5^c$

Eg:  $360 = 2^3 \times 3^2 \times 5^1$

2	360
2	180
2	90
3	45
3	15
5	5
1	

\* Total No. of Factor =  $(a+1) \times (b+1) \times (c+1)$   
 $= (3+1) \times (2+1) \times (1+1)$   
 $= 4 \times 3 \times 2$

$= 24$

\* Total No. of even Factor =  $a \times (b+1) \times (c+1)$   
 $= 3 \times (2+1) \times (1+1)$   
 $= 3 \times 3 \times 2$   
 $= 18$

\* Total No. of odd Factor =  $(b+1) \times (c+1)$   
 $= (2+1) \times (1+1)$   
 $= 3 \times 2$   
 $= 6$

\* Sum of Factor =  $\left(\frac{2^{a+1}-1}{2-1}\right) \times \left(\frac{3^{b+1}-1}{3-1}\right) \times \left(\frac{5^{c+1}-1}{5-1}\right)$   
 $= \frac{2^{3+1}-1}{2-1} \times \frac{3^{2+1}-1}{3-1} \times \frac{5^{1+1}-1}{5-1}$   
 $= \frac{16-1}{1} \times \frac{27-1}{2} \times \frac{25-1}{4}$   
 $= 15 \times \frac{26}{2} \times \frac{24}{4}$

$15 \times (10+3)$   
 $\frac{150}{45}$   
 $\frac{5}{1} \frac{3}{5} \times 6$   
 $\frac{11}{10}$

$= 15 \times 13 \times 6 = 1170$



\* Sum of even Factor =  $\left(\frac{2^{a+1} - 2}{2-1}\right) \left(\frac{3^{b+1} - 1}{3-1}\right) \left(\frac{5^{c+1} - 1}{5-1}\right)$

$$\begin{array}{r} 14 \times (102) \\ \hline 140 \\ \underline{92} \\ 102 \times 6 \\ \hline 1092 \end{array}$$

$$\begin{aligned} &= \frac{2^4 - 2}{1} \times 13 \times 6 \\ &= 14 \times 13 \times 6 \\ &= 1092 \end{aligned}$$

\* Sum of odd factor =  $\left(\frac{3^{b+1} - 1}{3-1}\right) \left(\frac{5^{c+1} - 1}{5-1}\right)$

$$\begin{aligned} &= 13 \times 6 \\ &= 78 \end{aligned}$$

Homework [common]

1.780

- Total No. of Factor
- Total odd Factor
- " even "
- Sum of all Factor
- " " even "
- " " odd Factor























