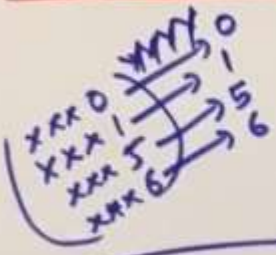
UnitDigit

Number systems



Unit digits

23456 [7] → unit digit or last digit

$(9581)^{1032} \times (9476)^{133} \times (8641)^{147}$

eg. $(1116)^{9786} = ?$ → unit digit → 6 ✓

eg. $(2346)^{345} \times (3981)^{1025} = ?$

unit → $6 \times 1 = 6$ ✓ (unit digit = 1)

Q. $2134 \times 2222 \times 2433 = ?$

$4 \times 2 \times 3 = 4$ ✓ (24 | 14)

Q. $21426^{?} + 22423^{?} + 22415 = ?$

(a) xxxx3 (b) xxxx4 (c) xxxx5

Unit digit

0, 1, 5, 6 → unit digit same

✓ $(9481)^{2346} = 1$

unit digit = 1 (Last digit)

NOW xxx4 $(xxx4)^{yyyy}$ → $4^1 = 4, 4^2 = 16, 4^3 = 64, 4^5 = 256 \cdots$

$(4)^{odd} = 4$

$(4)^{even} = 6$

$(xxx9)^{yyyy}$ = $(45679)^{\frac{234}{}} = 1$ (1 sec)

$9^1 = 9$ $9^2 = 81$ $9^3 = 729$ $9^4 = 6561$ ($9^3 \times 9$: 2, 8, 7, 3)

$(9)^{odd} = 9$ ✓

$(9)^{even} = 1$ ✓

UNIQUE METHOD

Unit digit = $(x)^n$ ✓ → U.D

$\frac{n}{4}$: Rem = 1 ⇒ $(U.D)^1$ ⇒

$\frac{n}{4}$ ⇒ Rem = 2 ⇒ $(U.D)^2$ ⇒

$\frac{n}{4}$ ⇒ Rem = 3 ⇒ $(U.D)^3$ ⇒

$\frac{n}{4}$ ⇒ Rem = 0 ⇒ $(U.D)^4$ ⇒

Q2. $2016^{2015} - 2015^{2016} = ?$ (1)

0, 1, 5, 6 ⇒ unit digit ⇒

6 − 5 = 1

10 sec ✓

Q3. $(979)^{167} \times (676)^{119} \times (878)^{?}$ (18)

TCS NQT 2019

9 → U.D ✓

$(9)^{odd} = 9$ ✓

$(9)^{even} = 1$ ✓ $4 \times 4 = 16$

always n = 2 digit (54)

$9 \times 6 \times 4 = 6$

$\frac{n}{4} = \frac{18}{4}$: Rem = 2 ⇒ $(U.D)^2$

$= (8)^2 = 64$

Q4. $(9581)^{1032} \times (9876)^{133} \times (8629)^{147} + (6827)^{10825} + (9735)^{168} = ?$

$1 \times 6 \times 9 + 7 + 5$

$= 4 + 7 + 5 = 16 : 6$ ✓✓

5 4 ✓

Complicated 10sec

✓0,1,5,6 → 0,1,5,6

$\frac{n}{4} = \frac{25}{4} \Rightarrow$ Rem: 1 $\Rightarrow (U.D)^1$

$: (7)^1 : 7$

$(9)^{odd} = 9$

$(9)^{even} : 1$ ✓

TCS NQT 2019 ✓✓

Onlinestudy4u UNIT DIGIT-2 Number System

Q1. The digit in unit place of product $71 \times 72 \times 73 \times \dots \times 79$ is.

(a) 0 (b) 1 (c) 2 (d) 6

Unit digit

$= 12 \times 13 \times 14$ 4 ✓

$=$

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

72×75

0 ✓

$\Rightarrow 12 \times 13 \times 15$

$=$

0 ✓

✓ 115 × 112 ⇒ 0

✓ 115 × 117 ⇒ 5

Part I

1. U·D = 0,1,5,6 ⇒ UD: 0,1,5,6

$(6256)^{147} = 6$

2. $U.D = x^n$

$\frac{n}{4}$: Rem: 1 ⇒ $(U.D)^1$

Rem: 2 ⇒ $(U.D)^2$

Rem: 3 ⇒ $(U.D)^3$

Rem: 0 ⇒ $(U.D)^4$

3. $(4)^{odd} = 4$ ✓ $(4)^{even} = 6$

$(9)^{odd} = 9$ ✓ $(9)^{even} = 1$ ✓

Q2. Find out the unit digit in 111! ?

(a) 0 (b) 1 (c) 3 (d) 5

111! < 10sec

Leave

Factorial

$n! = n \times (n-1) \times (n-2) \times \dots \times 1$

$5! = 5 \times 4 \times 3 \times 2 \times 1$

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

$111! = 111 \times 110 \times 100 \times \dots \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$

U.D = 0

Q3. The digit in units place of product is
$(3464)^{1793} \times (3615)^{317} \times (7131)^{491}$ is ?

(a) 0 (b) 2 (c) 3 (d) 4

U.D: $(3464)^{1793} \times (3615)^{317} \times (7131)^{491}$ ✓

$\Rightarrow 4 \times 5$

0

$(4)^{odd} = 4$

$(4)^{even} = 6$

0, 1, 5, 6

Q4. The units digit in product $771 \times 663 \times 365$ is

(a) 1 (b) 2 (c) 3 (d) 4

0, 1, 5, 6

x^n

U.D $7^{771} \times 6^{663} \times 3^{65}$ = U.D

$7^3 \times 6 \times 3$

$7 \times 7 \times 7$

9×7

3

$3 \times 6 \times 3$

$= 4$

$\frac{71}{4} = 17$

Rem: 3

U.D: $(7)^3$

$\frac{65}{4} = 16$

Rem: 1

U.D: $(3)^1$

Q5. Find the unit place of $(795 - 358)$.

(a) 7 (b) 3 (c) 4 (d) 0

$(x)^n$ = U.D

$7^{95} - 3^{58}$

13 − 9

4

(-ve Number) ?

$\frac{n}{4} : \frac{95}{4} = 23$

Rem: 3

U.D: $(7)^3$

$= 7 \times 7 \times 7$

$= 3$

$\frac{58}{4} = 14$

Rem: 2

U.D: $(3)^2 = 9$

Q6. find out the unit digit?

$$\left(\left(\left((1232)^{92463}\right)^{43261}\right)^{9264321}\right)^{1900}$$

$$\Rightarrow \left(\left(\left(\times\times\times\times\times\times 8\right)^{43261}\right)^{9264321}\right)^{1900}$$

$$\left((8)^{9264321}\right)^{1900}$$

$$(8)^{1900}$$

$(8)^4 = 8\times8\times8\times8$

$4\times4 = 6$

$\Rightarrow \boxed{6}$

: ?

Asked by a Student

1900

19x19025

$\frac{n}{4} \Rightarrow \frac{63}{4} \Rightarrow$ 15, Rem=3

U·D: $(2)^3 = 8$

$\frac{61}{4}$ = 15, Rem = 1

U·D: $(U\cdot D)^1 = (8)^1 = 8$

$\frac{21}{4}$ = 5, Rem = 1

$(8)^1 = 8$

$\frac{00}{4}$ $\frac{100}{4}$ $\frac{1900}{4}$: Rem=0

U·D: $(U\cdot D)^4$