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UNIT DIGIT POSITION

To understand the concept of unit digit, we must know the concept of cyclicity . This concept is mainly about the unit digit of a number and its repetitive pattern on being divided by a certain number

The concept of unit digit can be learned by figuring out the unit digits of all the single digit numbers from 0 - 9 when raised to certain powers.

These numbers can be broadly classified into three categories for this purpose:

1. **Digits 0, 1, 5 & 6:** When we observe the behaviour of these digits, they all have the same unit's digit as the number itself when raised to any power, i.e. 0^n = 0, 1^n =1, 5^n = 5, 6^n = 6. Let's apply this concept to the following example.

2. **Digits 4 & 9:** Both these numbers have a cyclicity of only two different digits as their unit's digit.Let us take a look at how the powers of 4 operate:

$4^1 = \underline{4}$,

$4^2 = 1\underline{6}$,

$4^3 = 6\underline{4}$, and so on.

Hence, the power cycle of 4 contains only 2 numbers 4 & 6, which appear in case of odd and even powers respectively.

Likewise, the powers of 9 operate as follows:

$9^1 = \underline{9}$,

$9^2 = 8\underline{1}$,

$9^3 = 72\underline{9}$, and so on.

Hence, the power cycle of 9 also contains only 2 numbers 9 & 1, which appear in case of odd and even powers respectively.

So, broadly these can be remembered in even and odd only, i.e. $4^{odd} = 4$ and $4^{even} = 6$. Likewise, $9^{odd} = 9$ and $9^{even} = 1$.

3. **Digits 2, 3, 7 & 8:** These numbers have a power cycle of 4 different numbers.

21 = 2, 22 = 4, 23 = 8 & 24 = 16 and after that it starts repeating.

So, the cyclicity of 2 has 4 different numbers 2, 4, 8, 6.

31 = 3, 32 = 9, 33 = 27 & 34 = 81 and after that it starts repeating.

So, the cyclicity of 3 has 4 different numbers 3, 9, 7, 1.

7 and 8 follow similar logic.

The concepts discussed above are summarized in the given table.

Number	Cyclicity	Power Cycle
1	1	1
2	4	2, 4, 8, 6
3	4	3, 9, 7, 1
4	2	4, 6
5	1	5
6	1	6
7	4	7, 9, 3, 1
8	4	8, 4, 2, 6
9	2	9, 1
10	1	0

Question: 01

Find the units digit of 7^{157}?

A. 1
B. 3
C. 4
D. 7

Answer: D

Question: 02

What is the units digit in the product (3^{65} * 6^{59} * 7^{71})

A. 1
B. 2
C. 4
D. 6

Answer: C

Question: 03

What is the units digit in$(7^{95} - 3^{58})$?

A. 0
B. 4
C. 6
D. 7

Answer: B

Question: 04

What is the units digit of $(6374)^{1793} \times (625)^{317} \times (341)^{491}$

A. 0
B. 2
C. 3
D. 5

Answer: A

Question: 05

Find the units digit of $33^{43} + 43^{33}$

A. 0
B. 3
C. 7
D. 9

Answer: A

Question: 06

What is the digit expected at units place of following mathematical operation: ($6^{15} - 7^{4} - 9^{13}$) ?

A. 0
B. 2
C. 4
D. 6

Answer: D

Question: 07

Find the unit digit number of $2^{3^{\wedge}4^{\wedge}5}$

A. 2
B. 4
C. 6
D. 8

Answer: A

Question: 08

Find the last digit of $225^{66\wedge 33}$?

A. 0
B. 3
C. 4
D. 5

Answer: D

Question: 09

Find the units digit of 259^{53^5} ?

A. 1
B. 3
C. 9
D. 7

Answer: C

Question: 10

Find the unit digit number of $334^{22^{\wedge}45}$?

A. 2
B. 4
C. 6
D. 8

Answer: C

Question: 11

What is the unit digit in the product (3^{65} x 6^{59} x 7^{71})?

A. 1
B. 2
C. 4
D. 6

Answer: C

Question: 12

The unit digit in the product (784 x 618 x 917 x 463) is:

A. 2
B. 3
C. 4
D. 5

Answer: A

Question: 13

What is the unit digit in 7^{105} ?

A. 1
B. 5
C. 7
D. 9

Answer: C

Question: 14

What is the unit digit in $(4137)^{754}$?

A. 1
B. 3
C. 7
D. 9

Answer: D

Question: 15

What is the unit digit in$(7^{95} - 3^{58})$?

A. 0
B. 4
C. 6
D. 7

Answer: B

THANK YOU