

How to Solve: Last Two Digits of Power of 7

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YouTube Video Link to this Post is [Here](#)

Following is Covered in this post

- Theory of Last Two Digits of Power of 7
- Find Last Two Digits of 781?
- Find Last Two Digits of 737 ?
- Find Last Two Digits of $780a + 51$ (given that a is a positive integer)?

Theory of Last Two Digits of Power of 7

- **To find Last Two Digits of any positive integer power of 7**

We need to find the cycle of Last Two Digits of power of 7

7^1 Last Two Digits is 07

7^2 last two digits is $07*7 = 49$

7^3 last two digits is $49*7 = 43$

7^4 last two digits is $43*7 = 01$

7^5 last two digits is $01*7 = 07$

7^6 last two digits is $07*7 = 49$

7^7 last two digits is $49*7 = 43$

7^8 last two digits is $43*7 = 01$

=> The power repeats after every 4th power

=> **Cycle of Last Two Digits of power of 7 = 4**

=> We need to divide the power by 4 and check the remainder

=> Last Two Digits will be same as Last Two Digits of $7^{\text{Remainder}}$

NOTE: If Remainder is 0 then Last Two Digits = Last Two Digits of $7^{\text{Cycle}} = \text{Last Two Digits of } 7^4 = 01$

Q1. Find Last Two Digits of 7^{93} ?

Sol: We need to divided the power (93) by 4 and get the remainder
93 divided by 4 gives 1 remainder
 \Rightarrow Last Two Digits of $7^{93} =$ Last Two Digits of $7^1 = 07$

Q2. Find Last Two Digits of 7^{1529} ?

Sol: 1529 divided by 4 will give the same remainder as 29 by 4 which is 1
[Watch this video](#) to **Master Divisibility Rules**
 \Rightarrow Last Two Digits of $7^{1529} =$ Last Two Digits of $7^1 = 07$

Q3. Find Last Two Digits of $7^{80a + 51}$ (given that a is a positive integer)?

Sol: Remainder of $80a + 51$ divided by 4 = Remainder of $80a$ by 4 + Remainder of 51 by 4
 $= 0 + 3 = 3$
 \Rightarrow Last Two Digits of $7^{80a + 51} =$ Last Two Digits of $7^3 = 43$

Hope it helps!

[Link to Theory for Last Two digits of exponents here.](#)

[Link to Theory for Units' digit of exponents here.](#)