How to Solve: Last Two Digits of Power of 6
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YouTube Video Link to this Post is Here

Following is Covered in the Video

- Theory of Last Two Digits of Power of 6
- Find Units' digit of 6^{71} ?
- Find Units' digit of 6^{12517}?

Theory of Last Two Digits of Power of 6

• To find Last Two Digits of any positive integer power of 6

We need to find the cycle of last two digits of power of 6	
6^1 last two digits is 06 6^2 last two digits is 06*6 = 36 6^3 last two digits is 36*6 = 16 6^4 last two digits is 16*6 = 96 6^5 last two digits is 96*6 = 76 6^6 last two digits is 76*6 = 56	6^7 last two digits is 56*6 = 36 6^8 last two digits is 36*6 = 16

=> The power repeats after every 5th power
=> **Cycle of last two digits of power of 6 = 5 (ignoring 6^1)**
=> We need to subtract one from the power and then divide the power by 5 and check the remainder
=> Last two digits will be same as last two digits of $6^{1+Remainder}$

NOTE: If Remainder is 0 then last two digits = last two digits of $6^{1+Cycle}$ ***= last two digits of*** 6^6 ***= 56***

Q1. Find Last two digits of 6^{71}?

Sol: We need to subtract 1 from 71 and then divided the remaining power (71-1=70) by 5 and get the remainder
70 divided by 5 gives 0 remainder = remainder of 5
=> Last two digits of 6^{71} = Last two digits of 6^{1+5} = 56

Q2. Find Last two digits of 6^{12517}?

Sol: 12517 - 1 = 12516
12516 divided by 5 will give the same remainder as 6 by 5 which is 1
Watch this video to **Master Divisibility Rules**

=> Last two digits of 6^{12517} = Last two digits of 6^{1+1} = 36

Hope it helps!

Link to Theory for Last Two digits of exponents here.

Link to Theory for Units' digit of exponents here.