How to Solve: Last Two Digits of Power of 11
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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 11
• Find Units' digit of 11^{128} ?
• Find Units' digit of 11^{15342} ?

Theory of Last Two Digits of Power of 11

• To find Last Two Digits of any positive integer power of 11

We need to find the cycle of last two digits of power of 11	
11^1 last two digits is 11	11^7 last two digits is 61*11 = 71
11^2 last two digits is 11*11 = 21	11^8 last two digits is 71*11 = 81
11^3 last two digits is 21*11 = 31	11^9 last two digits is 81*11 = 91
11^4 last two digits is 31*11 = 41	11^{10} last two digits is 91*11 = 01
11^5 last two digits is 41*11 = 51	11^{11} last two digits is 01*11 = 11
11^6 last two digits is 51*11 = 61	11^{12} last two digits is 11*11 = 21

=> **The power repeats after every 10th power**
=> **Cycle of last two digits of power of 11 = 10**
=> **We need to divide the power by 10 and check the remainder**
=> **Last two digits will be same as last two digits of $11^{Remainder}$**
=> **Unit's digit is 1, Tens' digit = Remainder**

NOTE: If Remainder is 0 then last two digits = last two digits of 11^{Cycle} = last two digits of 11^{10} = 01

Q1. Find Last two digits of 11^{128}**?**
Sol: We need to divided the power (128) by 10 and get the remainder
128 divided by 10 gives 8 remainder
Watch this video to Master Divisibility Rules
=> Last two digits of 11^{128} = Last two digits of 11^8 = 81

Q2. Find Last two digits of 11^{15342}**?**
Sol: 15342 divided by 10 will give the same remainder as 2 by 10 which is 2
Watch this video to Master Divisibility Rules
=> Last two digits of 11^{15342} = Last two digits of 11^2 = 21

Hope it helps!

Link to Theory for Last Two digits of exponents here.

Link to Theory for Units' digit of exponents here.