



How to Solve: Units' Digit of Power of 2

By [BrushMyQuant](#)

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

Following is Covered in this post

Theory of Units' Digit of Power of 2

- Find Units' digit of 2^{31} ?
- Find Units' digit of 2^{93} ?
- Find Units' digit of 2^{48} ?
- Find Units' digit of 2^{20x+74} (given that x is a positive integer)?
- Find Units' digit of 132^{1955} ?

Theory of Units' Digit of Power of 2

- To find units' digit of any positive integer power of 2

We need to find the cycle of units' digit of power of 2

2^1 units' digit is 2

2^2 units' digit is 4

2^3 units' digit is 8

2^4 units' digit is 6

2^5 units' digit is 2

2^6 units' digit is 4

2^7 units' digit is 8

2^8 units' digit is 6

=> The power repeats after every 4th power

=> **Cycle of units' digit of power of 2 = 4**

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

=> Units' digit will be same as Units' digit of $2^{\text{Remainder}}$

NOTE: If Remainder is 0 then units' digit = units' digit of 2^{Cycle} = units' digit of $2^4 = 6$

Q1. Find Units' digit of 2^{31} ?

Sol: We need to divided the power (31) by 4 and get the remainder
31 divided by 4 gives 3 remainder
 \Rightarrow Units' digit of $2^{31} = \text{Units' digit of } 2^3 = 8$

Q2. Find Units' digit of 2^{93} ?

Sol: 93 divided by 4 gives 1 remainder
 \Rightarrow Units' digit of $2^{93} = \text{Units' digit of } 2^1 = 2$

Q3. Find Units' digit of 2^{48} ?

Sol: 48 divided by 4 gives 0 remainder
 \Rightarrow Units' digit of $2^{48} = \text{Units' digit of } 2^4 = 6$

Q4. Find Units' digit of 2^{20x+74} (given that x is a positive integer)?

Sol: Remainder of $20x + 74$ divided by 4 = Remainder of $20x$ by 4 + Remainder of 74 by 4
 $= 0 + 2 = 2$
 \Rightarrow Units' digit of $2^{20x+74} = \text{Units' digit of } 2^2 = 4$

Q5. Find Units' digit of 132^{1955} ?

Sol: Units' digit of power of any number = Units' digit of power of the units' digit of that number
 \Rightarrow Units' digit of $132^{1955} = \text{Units' digit of } 2^{1955}$
 \Rightarrow Remainder of 1955 divided by 4 = Remainder of last two digits by 4

Watch this video to Master Divisibility Rules

\Rightarrow Remainder of 55 by 4 = 3
 \Rightarrow Units' digit of $132^{1955} = \text{Units' digit of } 2^3 = 8$

Hope it helps!