

$$\Rightarrow \left[\frac{p(v)}{2v} \right]$$

Tips & Tricks :-

In questions of PMI from JEE you don't have to actually solve the question using PMI. You can just check from the 4 options given to you one by one.

E.g.:- $4^n - 1$ is divisible by :

- (A) 5 (B) 2 (C) 3 (D) None of these

Sol:- We check for 5 :

$$\text{At } n=1 \Rightarrow 4^1 - 1 = 3 \text{ not divisible by } 5$$

We check for 2 :

$$\text{At } n=1 \Rightarrow 4^1 - 1 = 3 \text{ not divisible by } 2$$

Clearly 3 divides $4^n - 1$ at $n=1$

So, (C) is the answer

You can also check $n=2, 3$
 $4^2 - 1 = 15$ $4^3 - 1 = 63$

Ex-2 For all $n \in \mathbb{N}$ $3 \cdot 5^{2n+1} + 2^{2n+1}$ is divisible by.
(V)

(A) 19 (B) 17 (C) 23 (D) 25

$$\text{at } n=1 \Rightarrow 3 \cdot 5^3 + 2^4$$

$$= 391$$

Now notation:-

$a|b \Leftrightarrow a$ "divides" b

$a \nmid b \Leftrightarrow a$ "not divides" b

$$\text{So } 19 \nmid 391$$

$$17 \nmid 391$$

$$23 \nmid 391$$

$$25 \nmid 391$$

No possible answer

(B) or (C)

At $n=2 \Rightarrow 3 \cdot 5^5 + 2^7 = 9503$

Since A, ~~D~~ are already out
let's check with B, C

So $17 \nmid 9503$ but $23 \mid 9503$

So (B) answer