Today's IIScian Approach

(P) Let G be a group of order 60 then $o(Z(G))$ can ~~have~~ be 4. (True / False).

Sol:- How to THINK

Recall some basic facts:

- $Z(G) \trianglelefteq G$ (centre is normal in G)
- If $\frac{G}{Z(G)}$ is cyclic $\Rightarrow G$ is Abelian
- If G is a group order 15, then G is cyclic.
- If G is finite group and $H \trianglelefteq G$ then $o\left(\frac{G}{H}\right) = \frac{o(G)}{o(H)}$
- Suppose $o(Z(G)) = 4$ then $o\left(\frac{G}{Z(G)}\right)$ is equal to $\frac{60}{4} = 15$
- So $\frac{G}{Z(G)}$ is cyclic $\Rightarrow G = Z(G)$
- Thus $o(Z(G)) = 60 \rightarrow\leftarrow$
- Hence NOT possible. ▨.