

Today's IIScian Approach

⊙ 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.  $\square$

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1 month Crash Course  
NET - JUNE 2017 @ 1<sup>st</sup> May