E

7. Let $G = \mathbb{Z}_6 \times \mathbb{Z}_9$. **LIST** the elements of the set $\{g \in G \mid g+g+g=0\}$. No explanation is needed.

$([0]_6, [0]_9)$
$([0]_6, [3]_9)$
$([0]_6, [6]_9)$
$([2]_6, [0]_9)$
$([2]_6, [3]_9)$
$([2]_6, [6]_9)$
$([4]_6, [0]_9)$
$([4]_6, [3]_9)$
$([4]_6, [6]_9)$

8. TRUE or FALSE. (If true, PROVE it. If false, give a COUNTER EXAMPLE.)
If G is an abelian group and $H = \{x^3 \mid x \in G\}$, then H is a subgroup of G.

True

H is closed If h_1 and $h_2 \in H$ then $h_1 = x_1^3$ and $h_2 = x_2^3$ for x_1 and x_2 in

$h_1 h_2 = x_1^3 x_2^3 = (x_1 x_2)^3 \in H$

(G is abelian)

id $\in H$ $id = id^3$

inverses If $h \in H$, then $h = x^3$ for some $x \in G$ so $h^{-1} = (x^{-1})^3$ which

is in H.