Exercise 5.46

Abstract Algebra 1
MATH 3140

SEBASTIAN CASALAINA

ABSTRACT. This is Exercise 5.46 from Fraleigh [Fra03, §5]:

Exercise 5.46. Prove that a cyclic group with only one generator can have at most 2 elements.

Solution. For any cyclic group $G = \langle g \rangle$, we have that both g and g^{-1} are generators. If G has only one generator, then $g = g^{-1}$, which implies that $|G| \leq 2$. Indeed, if $g = g^{-1}$, then $g^2 = e$, so that $G = \{e\}$ or $G = \{e, g\}$. $\qquad\square$

REFERENCES

[Fra03] John Fraleigh, *A First Course in Abstract Algebra*, Seventh edition, Addison Wesley, Pearson, 2003.

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