A Book of Abstract Algebra: Solutions to Chapter 4

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May 23, 2016

Set A

1.

$$\begin{aligned} & & axb &= c \\ \Rightarrow & & axbb^{-1} &= cb^{-1} \\ \Rightarrow & & a^{-1}ax &= a^{-1}cb^{-1} \\ \Rightarrow & & x &= a^{-1}cb^{-1} \end{aligned}$$

4.

$$\begin{aligned} & & ax^2 &= b \quad \textit{and} \quad x^3 = e \\ \Rightarrow & & a^{-1}ax^2 &= a^{-1}b \\ \Rightarrow & & x^2 &= a^{-1}b \\ \Rightarrow & & x^3 &= xa^{-1}b \\ \Rightarrow & & e &= xa^{-1}b \\ \Rightarrow & & e \cdot (a^{-1}b)^{-1} &= x \\ \Rightarrow & & x &= b^{-1}a \end{aligned}$$

Set B