⑤ Let $T = \{\sigma \in S_A \mid \sigma(b) = b\}$

18 (circled, top right)

T is a group.

closed   If $\sigma, \tau \in T$, then $\sigma\tau \in T$

because $\sigma\tau(b) = \sigma(\tau(b)) = \sigma(b) = b$ ✓

inverses   If $\sigma \in T$, then $\sigma^{-1} \in T$ because
$\sigma(b) = b$ ∴ $b = \sigma^{-1}(b)$.

The identity is in T so T is not empty.