2. For $\langle a\rangle$, generators are a and a^5; for $\langle b\rangle$, generators are b, b^3, b^5, and b^7; for $\langle c\rangle$, generators are c, c^3, c^7, c^9, c^{11}, c^{13}, c^{17}, c^{19}.

9. Six subgroups; generators are the divisors of 20.
Six subgroups; generators are a^k, where k is a divisor of 20.

11. By definition, $a^{-1} \in \langle a\rangle$. So, $\langle a^{-1}\rangle \subseteq \langle a\rangle$. By definition, $a = (a^{-1})^{-1} \in \langle a^{-1}\rangle$. So, $\langle a\rangle \subseteq \langle a^{-1}\rangle$.

14. 49. First note that the group is not infinite since an infinite cyclic group has infinitely many subgroups. Let $|G| = n$. Then 7 and $n/7$ are both divisors of n. If $n/7 \neq 7$, then G has at least 4 divisors. So, $n/7 = 7$. When 7 is replaced by p , $|G| = p^2$.

43. Let $|a| = m,\ b = n$ and $d = \gcd(m, n)$. Then $\operatorname{lcm}(m, n) = mn/d,\ |a^d| = m/d$, and $|b| = n$. Then by Exercise 41, $|a^d b| = \operatorname{lcm}(m, n)$.