A PRACTICE WORKSHEET

Answer the following either True of False. If False give a counter example if true either prove or state the relevant theorem.

(1) If $G = \langle a, b \rangle$, then every $g \in G$ can be written as $a^m b^n$ where m and n are integers.
(2) Every cyclic group is abelian.
(3) Every abelian group is cyclic.
(4) S_n has order n.
(5) D_n has order n.
(6) $\mathbb{Z}_n$ has order n.
(7) $GL(n, \mathbb{R})$ is infinite.
(8) There is a group of any order.
(9) A_n is a subgroup of D_n.
(10) Every element in a finite group has finite order.
(11) If $G = \langle a \rangle$, then every $g \in G$ can be written as a^m where m is an integer.
(12) If two finite groups have the same order, then those two groups are isomorphic.
(13) Given subgroups, H and K of G, $H \cup K$ is a subgroup of G.
(14) Given subgroups, H and K of G, $H \cap K$ is a subgroup of G.
(15) Every subgroup of an abelian group is normal.
(16) Every group of order 5 or less is abelian.
(17) A_n is a subgroup of S_n.
(18) Every group of order n is (isomorphic to) a subgroup of S_n.