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Mathematics 309a: Abstract Algebra
Winter Semester 2009
David Haines
Quiz #4
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Notation: $\langle \Re^*, \cdot \rangle$ denotes the group of non-zero real numbers under multiplication and $\langle \Re^+, \cdot \rangle$ is the group of positive real numbers under multiplication.

Definition. The **cyclic subgroup** generated by a is the set $\{a^n \mid n \in Z\}$, consisting of all powers (positive, negative, and 0) of a.

A. List the elements of the cyclic subgroup of $\langle \Re^+, \cdot \rangle$ generated by 1.

B. List the elements of the cyclic subgroup of $\langle \Re^+, \cdot \rangle$ generated by 2.

C. List the elements of the cyclic subgroup of $\langle \Re^*, \cdot \rangle$ generated by -1.

D. List the elements of the cyclic subgroup of $\langle \Re^*, \cdot \rangle$ generated by 2.