# SUBGROUPS GENERATED BY SUBSETS OF A GROUP

Kevin James

Kevin James Subgroups generated by subsets of a Group

< □ > < □ > < □ >

# PROPOSITION

If  $\mathcal{A}$  is any collection of subgroups of a group G, then  $\cap_{A \in \mathcal{A}} A$  is also a subgroup of G.

向下 イヨト イヨト

æ

### PROPOSITION

If  $\mathcal{A}$  is any collection of subgroups of a group G, then  $\cap_{A \in \mathcal{A}} A$  is also a subgroup of G.

#### DEFINITION

Suppose that G is a group and that  $A \subseteq G$ . Then we define the the subgroup generated by A to be  $\langle A \rangle = \bigcap_{A \subseteq H \leq G} H$ 

向下 イヨト イヨト

## DEFINITION

Suppose that G is a group and that  $A \subseteq G$ . We define

$$ar{A}=\{a_1\cdot\cdots\cdot a_k \hspace{1em}| \hspace{1em} k\geq 0; \hspace{1em} a_i\in A \hspace{1em} ext{or} \hspace{1em} a_i^{-1}\in A\}.$$

- 4 回 2 - 4 □ 2 - 4 □

æ

## DEFINITION

Suppose that G is a group and that  $A \subseteq G$ . We define

$$ar{A}=\{a_1\cdot\cdots\cdot a_k \mid k\geq 0; \ a_i\in A ext{ or } a_i^{-1}\in A\}.$$

## PROPOSITION

Suppose that G is a group and that  $A \subseteq G$ . Then  $\langle A \rangle = \overline{A}$ .