

# Proofs

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February 10, 2016

## 1 1

Theorem. If  $A$  and  $B$  are sets where  $A \cap B = A$  then  $A \subseteq B$ .

Proof.

Suppose  $A$  and  $B$  are sets where  $A \cap B = A$ .

To show  $A \subseteq B$ .

Choose  $x \in A$ . By our assumption that  $A \cap B = A$ ,  $x$  must also be an element of  $A \cap B$ . By the definition of intersection  $x \in A \wedge x \in B$  by simplification we can remove  $x \in A$ . Thus  $x \in B$ . Since  $x$  was chosen arbitrarily from  $A$  and we showed that it followed that  $x$  is in  $B$  we conclude  $A \subseteq B$ .

□

## 2 2

a)  $(-1,2)$

b)  $(-1,2)$

c)  $A_5 (-5,6)$

d)  $A_3 (-3,4)$