

Assignment #5 due Wednesday 10/19 by 5pm.

Assignment #6 due Wednesday 10/26 by 5pm

Exam 2 will cover chapters 4 and 5.
Scheduled for Friday 10/28

Assignment 5, #5

To show that $(gf)^{-1}(A) = f^{-1}(g^{-1}(A))$

Use one of the following strategies.

① Show $(gf)^{-1}(A) \subseteq f^{-1}(g^{-1}(A))$ and

$$f^{-1}(g^{-1}(A)) \subseteq (gf)^{-1}(A)$$

② $x \in (gf)^{-1}(A)$ if and only if - - - .

⋮
⋮
⋮
if and only if
 $x \in f^{-1}(g^{-1}(A))$

Remember

- ① given $h: D \rightarrow R$ and $A \subseteq R$
 $x \in h^{-1}(A)$ if and only if $f(x) \in A$.

This is in contrast to the analogous statements for image.

- ② given $h: D \rightarrow R$ and $A \subseteq D$,
- * $x \in A$ implies $f(x) \in f(A)$ by definition
 - * $f(x) \notin f(A)$ implies $x \notin A$ contrapositive
 - * But $f(x) \in f(A)$ does not imply $x \in A$.

Note You can't quantify a thing twice.
("introduce")