# Foundations of Mathematics — Math 300 Sections 902, 905

Thursday 29 October 2020 — Concept Quiz

## Answers to Concept Quiz Section 6.5

### Images and Preimages.

Let $A$ and $B$ be sets and suppose that $f\colon A \to B$ is a function. Each of the problems below involves two sets with a relation between them (either $\subseteq$, $=$, or $\supseteq$) that you are to determine.

Suppose that $S, T \subseteq A$ are subsets of $A$. Then $f(S \cap T) \subseteq f(S) \cap f(T)$

Suppose that $P, Q \subseteq B$ are subsets of $B$. Then $f^{-1}(P \cap Q) = f^{-1}(P) \cap f^{-1}(Q)$

Suppose that $S, T \subseteq A$ are subsets of $A$. Then $f(S \cup T) = f(S) \cup f(T)$

Suppose that $S \subseteq A$ is a subset of $A$. Then $S \subseteq f^{-1}(f(S))$

Suppose that $P \subseteq B$ is a subset of $B$. Then $P \supseteq f(f^{-1}(P))$

Suppose that $P, Q \subseteq B$ are subsets of $B$. Then $f^{-1}(P \cup Q) = f^{-1}(P) \cup f^{-1}(Q)$