42.4 Exercises

:1 (a) Show that the relation of divisibility, $m|n$, is representable.

(b) Show that $m|(k+n)$ & $m|n$ implies $m|k$.

:2 Numbers m and n are *relatively prime* if they have no prime factors in common. Show that m and n are relatively prime if and only if $\forall x(m|xn \Rightarrow m|x)$.

:3 If m is relatively prime with n and k, then m is relatively prime with nk.

:4 The surjective pairing operation is strictly monotonic in both its arguments: if $m < n$, then $\langle m, k\rangle < \langle n, k\rangle$ and $\langle k, m\rangle < \langle k, n\rangle$.