Algebraic notation for asymmetric paths

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This is a notation you can use to write asymmetric paths with same algebraic rules as for symmetric paths. The symmetric notation is the following:

f[g] <=> h

Which means:

$\forall \ x_0, x_1, \ldots x_{n-1} \ \{ \ h(g(x_0), g(x_1), \ldots g(x_{n-1})) = g(f(x_0, x_1, \ldots, x_{n-1})) \ \}$

An asymmetric path can use different functions on the arguments and return value:

$\forall \ x_0, x_1, \ldots x_{n-1} \ \{ \ h(g_0(x_0), g_1(x_1), \ldots g_{n-1}(x_{n-1})) = g_n(f(x_0, x_1, \ldots, x_{n-1})) \ \}$

This can be written as:

$f[g_0 \times g_1 \times \ldots \times g_{n-1} \rightarrow g_n]$ <=> h

For example, the following function predicts whether multiplying two numbers results in a prime:

mul([is_one] a, [is_prime] b) → [is_prime] a ∧ b

This can also be written this way:

mul[is_one × is_prime → is_prime] <=> and