

## Definition

A complex HASKELL expression  $\underline{\text{exp}}$  is *transformed* into  $\underline{\text{exp}}_{tr}$

iff

$\underline{\text{exp}}_{tr}$  results from  $\underline{\text{exp}}$  by repeated application of Rules (1) – (12) and no rule is applicable to  $\underline{\text{exp}}_{tr}$  any more.

## Theorem

Let  $\underline{\text{exp}}$  be a complex HASKELL expression. Then we have:

- (a) Application of the rules (1) – (12) *terminates*, i.e., there is an expression  $\underline{\text{exp}}_{tr}$ .
- (b) Up to Rule (10), the rules are *“confluent”*, i.e.,  $\underline{\text{exp}}_{tr}$  is unique up to the order of declarations and nested let-expressions.
- (c)  $\underline{\text{exp}}_{tr}$  is a *simple* HASKELL expression.