Mini-Project 2 Check-in Written Solutions

Desugaring

```
let foo : int -> int -> int = fun (x : int) -> fun (y : int) ->
  let bar : bool -> bool = fun (z : bool) -> z || x = y in
  bar true
in
let baz : unit -> int = fun (x : unit) ->  foo 1 2 in
let biz : int = baz () in
biz
```

Closures

$(\!| \{\texttt{x} \mapsto 5\ ,\ \texttt{g} \mapsto (\!| \{\texttt{x} \mapsto 5\} ,\cdot \mapsto \texttt{fun (x:int) -> x + x} |\!)\} ,\ \cdot \mapsto \texttt{fun (y:int) -> g x} |\!)$

Semantic Derivation

$$\langle \{\texttt{x} \mapsto \bot\ ,\ \texttt{f} \mapsto (\!| \varnothing\ ,\ \texttt{f} \mapsto \texttt{fun (x:bool) -> x || f true} |\!)\}\ ,\ \texttt{x || f true} \rangle \Downarrow \top$$
$$\langle \{\texttt{x} \mapsto \top\ ,\ \texttt{f} \mapsto (\!| \varnothing\ ,\ \texttt{f} \mapsto \texttt{fun (x:bool) -> x || f true} |\!)\}\ ,\ \texttt{x || f true} \rangle \Downarrow \top$$