Specifying the Behavior of Expressions

Exercise 3.1

$\lfloor$`(value-of <<x>> ρ)`$\rfloor$ = `10`

$\lfloor$`(value-of <<3>> ρ)`$\rfloor$ = `3`

$\lfloor$`(value-of <<v>> ρ)`$\rfloor$ = `5`

$\lfloor$`(value-of <<i>> ρ)`$\rfloor$ = `1`

Exercise 3.2

A $val \in ExpVal$ must be that which is in $Int+Bool$. Then a $val \in ExpVal$ for which $\lceil\lfloor val \rfloor\rceil \neq val$ is where $val \in Bool$, such as $val = true$.

Exercise 3.3

We are able to describe the arithmetic operations in terms of subtraction. We cannot do so if we chose addition.

Exercise 3.4

Let ρ = `[x=`$\lceil$`33`$\rceil$`, y=`$\lceil$`22`$\rceil$`]`.

$$\dfrac{\texttt{(value-of-program <<if zero? (-(x,11)) then -(y,2) else -(y,4)>>)}}{\dfrac{\texttt{(value-of <<if zero? (-(x,11)) then -(y,2) else -(y,4)>> ρ)}}{\dfrac{\texttt{(value-of <<zero? (-(x, 11))>> ρ) = (bool-val \#f)}}{\dfrac{\texttt{(value-of <<-(y,4)>> ρ)}}{\lceil 18 \rceil}}}}$$