P505, Autumn 2016, IMP Formal Large-Step Semantics

\[
\begin{align*}
\text{s} &::= \text{skip} | x := e | s | \text{if } e \ s \ s | \text{while } e \ s \\
\text{e} &::= c | x | e + e | e \ast e \\
(c) &\in \{\ldots, -2, -1, 0, 1, 2, \ldots\} \\
(x) &\in \{x_1, x_2, \ldots, y_1, y_2, \ldots, z_1, z_2, \ldots, \ldots\}
\end{align*}
\]

Not shown: Definition for “getting” and “setting” a variable in the heap. Informally:

- \(\text{get}(H,x,c)\) means looking up \(x\) in \(H\) produces \(c\).
- \(\text{set}(H_1,x,c,H_2)\) means \(H_2\) is like \(H_1\) except in \(H_2\) looking up \(x\) produces \(c\) (which might or might not be what you get when looking up \(x\) in \(H_1\)).