44.

(a) Define Global

$$\frac{\langle e, \rho\{x \mapsto l\}, \sigma\{l \mapsto \text{unspecified}\}\rangle \Downarrow \langle v, \sigma'\rangle}{\langle \text{VAL}(x, e), \rho, \sigma\rangle \rightarrow \langle \rho\{x \mapsto l\}, \sigma'\{l \mapsto v\}\rangle}$$

(b)
```
(val y 1)
(val f (lambda () y))
(val y 2)
(f)
; The program uses Scheme semantics if the last value evaluates to 2.
; The program uses new Scheme semantics if the last value evaluates to 1
; These statements are true because in Scheme, a val binding of a
; name that is already bound is equivalent to set, so y in f gets 1. However
; new Scheme always creates a new binding, so the y in f gets changed to
; the second declared y which contains 2 in the new location.
```

(c) I prefer the regular Scheme because if I wanted to not change the variable I could just create a new name. The new style gives the option of changing it.