46. A) $$\frac{l \notin dom\ \sigma \quad \langle e, \rho\{x \mapsto l\}, \sigma\{l \mapsto unspecified\}\rangle \Downarrow \langle v, \sigma' \rangle}{\langle VAL(x,e), \rho, \sigma \rangle \rightarrow \langle \rho\{x \mapsto l\}, \sigma'\{l \mapsto v\}\rangle}$$

B)

```
; val semantics detector

;; It binds x to the value 2 and uses x in a function. It then changes the
;; value of x to 5 and calls that function. If it is using Scheme semantics, the
;; value that x is bound to will update to 5. If it is using new semantics, it
;; will remain at 2, since it logged the previous location of the value of x
;; and the new value is stored in a different location.

(val x 2)

(define mult-two (y)
    (* x y))

(val x 5)

(define value-detector ()
    (if (= 5 (mult-two 1))
        'Scheme-semantics
        'New-semantics))

(value-detector)
```

C) I prefer the Scheme semantics because it allows the functions to always have the updated values of all the variables, since the location never changes.