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(a)

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

(b)

code
```
(val x 3)
(define y () (* x x))
(val x 4)
(y)
```

if in old version (y) = 16, because it will use the same location, only change value to 4, (y) = 16

if in new version (y) = 9, because second val x will create a location, But what x in y is still in the old location, so (y) = 9

(c) I prefer old version for new version. Because if we change val x value, we actually want a new value in the function y, but the function still use, the old location.