continuations-theory

a.

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

b.

```
(val x 3)
(define detectSemantics () x)
    (val x 1)
    (if (= detectSemantics 3) 'new 'scheme)
```

$$\rho' \ is \ \{x \mapsto l_1\},\ \sigma' \ is \ \{l_1 \mapsto 3\}$$

detectSemantics always uses rho prime and sigma prime

for new,

$$\rho' \ is \ \{x \mapsto l_1\},\ \sigma' \ is \ \{l_1 \mapsto 3\}$$

for scheme,

$$\rho' \ is \ \{x \mapsto l_1\},\ \sigma' \ is \ \{l_1 \mapsto 1\}$$

```
(if (= detectSemantics 1) 'new 'scheme)
```

detectSemantics returns 1 for the new semantics, and 3 for old semantics

c. scheme. Scheme is simpler, more straightforward, and unique in name.