

## Answers to Big-Step Exercises, #1



```

8 ↓ 8 [value]
2 ↓ 2 [value]
----- [less-than]
(< 8 2) ↓ #f
3 ↓ 3 [value]
4 ↓ 4 [value]
----- [addition]
(+ 3 4) ↓ 7
----- [if-false]
(if (< 8 2) (+ #f 5) (+ 3 4)) ↓ 7
    
```

```

1 ↓ 1 [value]
2 ↓ 2 [value]
----- [addition]
(+ 1 2) ↓ 3
3 ↓ 3 [value]
7 ↓ 7 [value]
----- [subtraction]
(- 3 7) ↓ -4
----- [if-nonfalse]
(if (+ 1 2) (- 3 7) (/ 9 0)) ↓ -4
    
```

Expr/dec solns 1

## Answers to Big-Step Exercises, #2



```

1 ↓ 1 [value]
2 ↓ 2 [value]
----- [less-than]
(< 1 2) ↓ #t
3 ↓ 3 [value]
4 ↓ 4 [value]
----- [multiplication]
(* 3 4) ↓ 12
----- [if-nonfalse]
(if (< 1 2) (* 3 4) (/ 5 6)) ↓ 12
7 ↓ 7 [value]
----- [addition]
(+ (if (< 1 2) (* 3 4) (/ 5 6)) 7) ↓ 19
    
```

```

1 ↓ 1 [value]
2 ↓ 2 [value]
----- [if-nonfalse]
(if 1 2 3) ↓ 2
#t ↓ #t [value]
-----
(+ (if 1 2 3) #t)
    
```

Stuck here! Can't apply [addition] rule because #t is not a number in (+ 2 #t). This models a dynamic type checking error.

Expr/dec solns 2

## Answers to Small-Step Exercises, #1



```

(if {(< 8 2)} (+ #f 5) (+ 3 4))
=> (if #f (+ #f 5) (+ 3 4)) [less than]
=> {(* 3 4)} [if false]
=> 12 [multiplication]
    
```

```

(if {(+ 1 2)} (- 3 7) (/ 9 0))
=> (if 3 (- 3 7) (/ 9 0)) [addition]
=> {(- 3 7)} [if nonfalse]
=> -4 [subtraction]
    
```

Expr/dec solns 3

## Answers to Small-Step Exercises, #2



```

(+ (if {(< 1 2)} (* 3 4) (/ 5 6)) 7)
=> (+ (if #t (* 3 4) (/ 5 6)) 7) [less than]
=> (+ {(* 3 4)} 7) [if nonfalse]
=> {(+ 12 7)} [multiplication]
=> 19 [addition]
    
```

```

(+ {(if 1 2 3)} #t)
=> (+ 2 #t) [if nonfalse]
    
```

Stuck here! Can't apply [addition] rule because #t is not a number in (+ 2 #t). This models a dynamic type checking error.

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