

Questions 1-5

Question 1

1/1 point (graded)

Which of the following scope contours is correct for this program?



a, b, foo

```
(define a 1)
(define b 2)

(local [(define a 3)
        (define (foo b) (+ a b))]
  (foo (+ b 1)))
```



a, b, foo

```
(define a 1)
(define b 2)

(local [(define a 3)
        (define (foo b) (+ a b))]
  (foo (+ b 1)))
```



a, b

```
(define a 1)
(define b 2)

(local [(define a 3)
        (define (foo b) (+ a b))]
  (foo (+ b 1)))
```



a, b, foo

```
(define a 1)
(define b 2)

(local [(define a 3)
        (define (foo b) (+ a b))]
  (foo (+ b 1)))
```



Explanation

The definitions that are recorded in the scope of the whole program (blue) are a and b, and the definitions that are recorded in the scope of the local expression (red) are a and foo, since they are defined inside the local expression.

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Question 2

1/1 point (graded)

Consider the following program:

```
(define a 1)
(define b 3)
(define c 2)

(+ a
  (local [(define a 2)
          (define b (+ 1 a))]
    (+ c b))
  b)
```

Which of the following is the correct reference for the circled a?

☒ (define a 1)
(define b 3)
(define c 2)

(+ a
 (local [(define a 2)
 (define b (+ 1 a))]
 (+ c b))
 b)

☐ (define a 1)
(define b 3)
(define c 2)

(+ a
 (local [(define a 2)
 (define b (+ 1 a))]
 (+ c b))
 b)

☐ (define a 1)
(define b 3)
(define c 2)

(+ a
 (local [(define a 2)
 (define b (+ 1 a))]
 (+ c b))
 b)



Explanation

Using scope contours:

```
      a, b, c
(define a 1)
(define b 3)
(define c 2)

(+ a      a, b
  (local [(define a 2)
          (define b (+ 1 a))]
    (+ c b))
  b)
```

The reference should go to the definition of a in the nearest closing box, which is (define a 1) in this case.

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Question 3

1/1 point (graded)

Which of the following is the correct reference for the circled a?

☐ (define a 1)
(define b 3)
(define c 2)

(+ a
 (local [(define a 2)
 (define b (+ 1 a))]
 (+ c b))
 b)

☒ (define a 1)
(define b 3)
(define c 2)

(+ a
 (local [(define a 2)
 (define b (+ 1 a))]
 (+ c b))
 b)

☐ (define a 1)
(define b 3)
(define c 2)

(+ a
 (local [(define a 2)
 (define b (+ 1 a))]
 (+ c b))
 b)



Explanation

Using scope contours:

```

a, b, c
(define a 1)
(define b 3)
(define c 2)

(+ a
  (local [(define a 2)
          (define b (+ 1 a))]
    (+ c b))
  b)
```

The reference should go to the definition of a in the nearest closing box, which is (define a 2) in this case.

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Question 4

1/1 point (graded)

Which of the following is the correct reference for the circled b?

☒

```
(define a 1)
(define b 3)
(define c 2)

(+ a
  (local [(define a 2)
          (define b (+ 1 a))])
    (+ c b)
    b)
```

☐

```
(define a 1)
(define b 3)
(define c 2)

(+ a
  (local [(define a 2)
          (define b (+ 1 a))])
    (+ c b)
    b)
```

☐

```
(define a 1)
(define b 3)
(define c 2)

(+ a
  (local [(define a 2)
          (define b (+ 1 a))])
    (+ c b)
    b)
```



Explanation

Using scope contours:

```
(define a 1)
(define b 3)
(define c 2)

(+ a
  (local [(define a 2)
          (define b (+ 1 a))])
    (+ c b)
    b)
```

Diagram illustrating scope contours for the code above. A blue box labeled "a, b, c" encompasses the entire code block. A red box labeled "a, b" encompasses the inner `(local ...)` block and the `(+ c b)` expression. The `b)` at the end of the `(+ a ...)` expression is outside both boxes.

The reference should go to the definition of `b` in the nearest closing box, which is `(define b (+ 1 a))` in this case.

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Question 5

1/1 point (graded)

Which of the following is the correct reference for the circled `b`?

☐ `(define a 1)`
`(define b 3)`
`(define c 2)`

`(+ a`
`(local [(define a 2)`
`(define b (+ 1 a))]`
`(+ c b))`

☐ `(define a 1)`
`(define b 3)`
`(define c 2)`

`(+ a`
`(local [(define a 2)`
`(define b (+ 1 a))]`
`(+ c b))`

☒ `(define a 1)`
`(define b 3)`
`(define c 2)`

`(+ a`
`(local [(define a 2)`
`(define b (+ 1 a))]`
`(+ c b))`



Explanation

Using scope contours:

a, b, c

```

(define a 1)
(define b 3)
(define c 2)

(+ a
  (local [(define a 2)
          (define b (+ 1 a))])
    (+ c b))
b)
  
```

a, b

The reference should go to the definition of `b` in the nearest closing box, which is `(define b 3)` in this case.

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