

QUIZ 4 SOLUTIONS

NAME: _____

April 4 and April 6, 2017

1. Fill in the following code so that it doesn't error. You may only use **hi**, **a**, and quotes.

```
(define hi #f)
(define (a) (if 'hi hi 61))
((lambda (a)
  (cond ((a) (/ 1 0))
        (a 'yay) (else bye))) a)
```

2. **Towers of Hanoi... Again!** The objective of the puzzle is to move the entire stack to an last rod, obeying the following rules:

- (a) Only one disk may be moved at a time.
- (b) Each move consists of taking the top (smallest) disk from one of the rods and sliding it onto another rod, on top of the other disks that may already be present on that rod.
- (c) No disk may be placed on top of a smaller disk.

Complete the hanoi function which implements the steps needed to complete the puzzle. Print-way is a function that moves the top disk from a first rod to a last rod. Do not worry about how it is implemented. Begin is a function that allows us to execute multiple recursive calls in order. This allows us to bypass the requirement of having only one recursive call in the else clause of the if expression.

```
(define (hanoi n first last sub)

  ( ( if (= n 1) )

    (print-way first last)
    (begin ( hanoi (- n 1) first sub last )

            ( hanoi 1 first last sub )

            ( hanoi (- n 1) sub last first ) )))

(define (print-way first last)
  (begin (display (list first '-> last ) ) (newline)))
```