

Quiz 2 Solution

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1. Consider the following method.

```
def make_adder(x):  
    def adder(n):  
        return x + n  
    return adder
```

```
make_adder(4)(5)
```

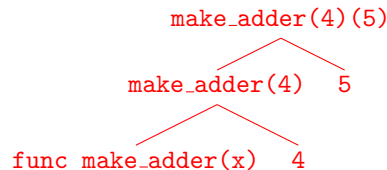
- (a) What is the operator of the above expression?

`make_adder(4)`

- (b) What are the operands?

`5`

- (c) Draw the expression tree.



2. Fill in the blanks (*without using any numbers in the first blank*) such that the entire expression evaluates to 9.

```
(lambda x: lambda y: lambda: y(x))(3)(lambda z: z*z)()
```

3. What is wrong with the following function? How can we fix it?

```
def factorial(n):  
    return n * factorial(n)
```

There is no base case and the recursive call is made on the same `n`.

```
def factorial(n):  
    return 1 if n == 0 else n * factorial(n - 1)
```

4. Environment Diagrams

```
(a) def dream1(f):  
    kick = lambda x: mind()  
    def dream2(secret):  
        mind = f(secret)  
        kick(2)  
    return dream2  
  
inception = lambda secret: lambda: secret  
real = dream1(inception)(42)
```

<http://goo.gl/kPefwE>

```
(b) def bar(f):  
    def g(x):  
        if x == 1:  
            return f(x)  
        else:  
            return f(x) + g(x - 1)  
    return g  
  
f = 4  
bar(lambda x: x + f)(2)
```

<http://goo.gl/BCJdjV>