1. Consider the following pseudo-code program:

```plaintext
sum : integer // a global variable
procedure add(amount : integer)
    sum := sum + amount
procedure p(x : integer, adder : procedure)
    integer sum
    sum := x
    adder(x) // invoke procedure that was passed as argument
    write_integer(sum)
begin // main program
    sum := 0
    p(1, add)
end
```

a. Suppose dynamic scoping with shallow binding is used by the interpreter to execute this code. What is the value printed by the program?

b. Suppose dynamic scoping with deep binding is used by the interpreter to execute this code. What is the value printed?

c. Suppose static scoping is used. What is the value printed by the program?

2. What is the value printed by the following pseudo-code program for each of the four parameter passing modes *call-by-value*, *call-by-reference*, *call-by-value/result*, and *call-by-name*? That is, for each of the four parameter passing modes assume that both the x and y parameters use that mode. Show how each program is evaluated in that mode and show the final value printed:

```plaintext
a : integer // a global variable
procedure p(in out x : integer, in y : integer)
    x := x + 1
    a := y
begin // main program
    a := 2
    p(a, a)
    write_integer(a)
end
```