

3. (2 Marks) What two distinct purposes are served by the Type Stack in Semantic Analysis?

a.

b.

4. (3 marks) Consider the following program.

```
var k: integer
var i: integer
procedure P (var n: integer)
    var m: integer
    m := 789
    n := k + 2 * m
end P
i := 123
k := 456
P (i)
```

Using the abstract machine instructions *push*, *pushaddress*, *subtract*, *add*, *multiply*, *evaluate*, *assign* and so on defined in the book, translate the following statement (ONLY) of above program into abstract machine code. Use (LL,ON) pairs, not variable names, to refer to variables in your answer.

```
n := k + 2 * m
```

