1. Use the stored procedure and the contents of the Staff table shown on the accompanying to answer parts a, b and c.

a. What value is returned by the call q3(10)?

q3(10) = 0

b. What value is returned by the call q3(16)?

q3(16) = 2

c. What value is returned by the call q3(27)?

q3(27) = 4

2. Write a stored procedure (function) that is passed a customer id and a copy number and returns a 1 if the customer has borrowed the copy, otherwise the function returns a 0.

```
CREATE OR REPLACE FUNCTION has_borrowed(
     customer_id integer,
     copy_number integer)
RETURNS integer AS $$
DECLARE
     did_borrow integer := 0;
BEGIN
     IF EXISTS (SELECT * FROM Customer NATURAL JOIN Loan WHERE Customer.cid = customer_id AND Loan.copynum = copy_number) THEN
        did_borrow := 1;
     END IF;
     RETURN did_borrow;
END;
$$ LANGUAGE plpgsql;
```

Stored Procedure for Problem 1

```
create or replace function q3(manager integer)
returns integer AS
$$
Declare
        num integer;
        empId integer;
Begin
        select mid into empId from Staff where sid = manager;
        if empId is null then
                num = 0;
        else
                num = 1 + q3(empId);
        end if;
        return num;
End;
$$ Language plpgsql;
```

Staff table content for problem 1

sid	first	last	libnum	mid
1	Gladys	Davis	1	
2	Bonnie	Baker	1	1
3	Thelma	Eisen	1	1
4	Doris	Sams	1	2
5	Norm	Derringer	1	2
6	Ruth	Lessing	1	2
7	Dave	Bancroft	1	2
8	Jimmie	Foxx	1	6
9	Dorothy	Kamenshek	1	6
10	Mary	Baker	2	
11	Sophie	Kurys	2	10
20	David	Hilbert	2	10
12	Clerk	Maxwell	2	11
13	Bertrand	Russell	2	11
14	Ada	Byron	2	11
15	Mary	Everest	2	11
16	Gottlob	Frege	2	11
17	Ludwig	Wittgenstein	2	16
18	Alan	Turing	2	16
19	John	Mauchly	2	16
28	Winifred	Merrill	2	16
21	Sophie	Germain	2	19
22	Leonhard	Euler	2	15
23	Maxwell	Weber	2	15
24	Alonzo	Church	2	15
25	Kurt	Godel	2	24
26	Sofia	Kovalevskaya	2	24
27	Emmy	Noether	2	24