1

```
int N
int count
return sum(N);
 sum (int num)
    { if (num % 2 == 1)
        count= sum(num/2)+1;
      else
        count = sum(num/2);
    }
```

2 a. $\sum_{i=0}^{\infty} \frac{1}{4^i} = \left(\frac{1}{4}\right)^i \qquad \frac{1}{1-A} = \frac{1}{1-\frac{1}{4}} = \frac{1}{(3/4)}$

b. $S = \sum_{i=0}^{\infty} \frac{i}{4^i} = 0 + \frac{1}{4} + \frac{2}{16} + \frac{3}{64} + \frac{4}{256} \ldots$

$4S = \cancel{1+}$

$4S - S = 1 + \frac{1}{4} + \cancel{\frac{2}{16}} \cancel{\frac{3}{64}} \ldots + \frac{1}{16} + \frac{1}{64}$

$3S = \frac{1}{1-\frac{1}{4}} \qquad 3S = \frac{4}{3} \qquad S = \frac{4}{9}$

3. $\cancel{F_{N-2}} + F_{N-3} + F_{N-4} \ldots + F_1 = F_N - 2$

$= F_{N-1} + \cancel{F_{N-2}} - 2$

$\cancel{F_{N-3}} + F_{N-4} \ldots + F_1 = F_{N-2} + \cancel{F_{N-3}} - 2$

$F_2 + F_1 = F_3 - 2$

$F_1 = 1 \qquad \cancel{F_2} + F_1 = F_3 + \cancel{F_2} - 2$

$F_0 = 1 \qquad \cancel{F_1} = F_2 + \cancel{F_1} - 2$

$0 = F_2 - 2$

$(F_1 + F_0) - 2$

$0 = 1 + 1 - 2$

$n=1$ $\quad \frac{1^2(1+1)^2}{4} = 1$ ✓ $\quad 1^3 = 1$

$$\frac{n^2\cancel{(n+1)^2}}{4} + (n+1)^{\cancel{3}} = \frac{\cancel{(n+1)^2}(n+2)^2}{4}$$

$$\frac{n^2}{4} + (n+1) = \frac{(n+2)^2}{4}$$

$$n^2+4n+4 = (n+2)^2$$

$$n^2+4n+4 = n^2+2n+2n+4$$

$$n^2+4n+4 = n^2+4n+4$$