Task 7 proof

Long f(int n) can be written as:

$$f(n) = \begin{cases} 0, & n = 0 \\ -f(-n), & n < 0 \\ f(n-1) + 3n \cdot (n-1), & n > 0 \end{cases}$$

Lets test f(4):

$f(4) = f(3) + 3 \cdot 4 \cdot (4-1)$
$f(3) = f(2) + 3 \cdot 3 \cdot (3-1)$
$f(2) = f(1) + 3 \cdot 2 \cdot (2-1)$
$f(1) = f(0) + 3 \cdot 1 \cdot (1-1)$
$f(0) = 0$

We can see that any f(n) would sum up all f(n) from 0 up to n
tis can be written as:

$$\sum_{n=1}^{n} 3n(n-1)$$

If we multiply we get: $\sum_{n=1}^{n} 3n^2 - 3n$

The full function becomes:

$$f(n) \begin{cases} 0, & n = 0 \\ -\sum_{n=1}^{n} 3n^2 + 3n, & \cancel{n > 0}\ n < 0 \\ \sum_{n=1}^{n} 3n^2 - 3n, & n > 0 \end{cases}$$

Since $\sum_{n=0}^{\infty} 3n^2+3n = 0$ and $-\sum_{n=0}^{A} -3n^2+3n = \sum_{n=0}^{<} 3n^2-3n$

We can simplify to:

$f(n) = \sum_{n=0}^{0} 3n^2+3n$

When implementing this in C++ i used ~~kep~~ a if statement to make the negative input loop a positive number of times:

```
//My implementation:
long f2(int n)
{
long result = 0;
if(n<0)
{
for (long i = 0; i<=n*-1; i++)
{
result += -(3*i*i-3*i);
}
}
else
{
for (long i = 0; i<=n; i++)
{
result += 3*i*i-3*i;
}
}
return result;
}
```