(1) (Text answer) Consider the following program for computing factorial numbers:

```
/* Factorial function definition */
int fact(int n)
{
  int i; /* counter variable */
  int f; /* factorial */

  /* pre-condition */
  assert (n >= 0);

  /* post-condition */
  f = 1;
  for(i = 1; i <= n; i = i + 1)
  {
    f = i * f;
  }
  return f;
}
```

Provide your answers to the following questions in a plain text file:

(a) How many arithmetic operations $(+, -, *, /)$ are required to compute `fact(5)`?

(b) How many arithmetic operations $(+, -, *, /)$ are required to compute `fact(n)` for any positive integer n?

Exercise 1:

a)

16 arithmetic operations are needed.

b)

The loop has to run n times before reaching the factorial.
The for-loop has three computing components, “i <= n” & “i = i + 1” & “f = 1 * f”.
The loop also has to end by running the comparison “i <= n” one final time.

The amount of arithmetic operations can therefore be described as $n_{ao} = n * 3 + 1$