Exercise 1: proof by induction

a) Base case
$fact(1) = 1$, this mean if we write 1! We will get 1, so the base case is true.

b) The inductive step
In the recursive step our program returns $n * fact(n - 1)$.
So, if $n = 2$, the recursive step is $2 * (2 - 1)$ which is the same as $2 * fact(1)$ or $2 * (1!)$, and it will continue in this manner for any $n > 1$.
Because $fact(1) = 1$ is correct
This mean $fact(k) = k * (k - 1)$ is also correct