Question 1

Considering that the function $fact(n)$ calculates $n!$ we assume that its works for every possivtive integer n.

For our base case where $n > 1$ we take n =1 because its the lowest positive integer:

$n = 1: \quad 1! = 1 \cdot (1 - 1)! = 1$

Because our base case stands true we also assume its works for $n = 2$:

$n = 2: \quad 2! = 2 \cdot (2 - 1)! = 2 \cdot 1 = 2$

As we see that it's also true for $n = 2$ we assume that it is also true for any integer k, where k > 1:

If $fact(k) = k \cdot fact(k - 1)$ is true then that means that:

$fact(k + 1) = (k + 1) \cdot fact(k)$ is also true since $fact(k)$ is true.