

ASSIGNMENT #4 SOLUTIONS.

1a: IF $n \geq 10$ AND EVEN

$$\text{THEN } n = (n-4) + 4.$$

$n-4$ IS AN EVEN NUMBER GREATER THAN OR EQUAL TO 6, SO ITS COMPOSITE.

4 IS COMPOSITE

1b: IF $n \geq 13$ AND ODD

$$\text{THEN } n = (n-9) + 9.$$

$n-9$ IS AN EVEN NUMBER GREATER THAN OR EQUAL TO 4. ~~AND~~ SO ITS COMPOSITE.

9 IS COMPOSITE.

(2)

2: IF $n \in \mathbb{N}$, $n \neq 1$ AND $2 \leq k \leq n$

THEN $n! + k = k \left(\frac{n!}{k} + 1 \right)$.

SINCE $k \leq n$ $\frac{n!}{k}$ IS A NATURAL
NUMBER $\implies n! + k$ IS COMPOSITE.