if $n=1$ then $3^7+7^3=11\times 230$

$\because n=1$ is true.

then let $n=k$ $\quad 3^{3k+4}+7^{2k+1}=11A$

then $n=k+1$ $\quad 3^{3(k+1)+4}+7^{2(k+1)+1}$

$$=3^{3k+3+4}+7^{2k+2+1}$$

$$=3^{3k+4}\cdot 27+7^{2k+1}\cdot 49$$

$$=3^{3k+4}(22+5)+7^{2k+1}(44+5)$$

$$=22\cdot 3^{3k+4}+5\cdot 3^{3k+4}+7^{2k+1}\cdot 44$$

$$+5\cdot 7^{2k+1}$$

$$=11(2\cdot 3^{3k+4}+4\times 7^{2k+1})$$

$$+5(3^{3k+4}+7^{2k+1})$$

$\therefore 11 \times (2 \times 3^{3k+4} + 4 \times 7^{2k+1}) = 11B$

$5 \cdot (3^{3k+4} + 7^{2k+1}) = 5 \cdot 11A$

$\therefore$ $n = k+1$ is true.

Thus $n=1$, $n=k$, $n=k+1$ are true.

The method is true.

(Q.E.D)