

It's false.

Since $3 * 4 = 12$, we can only let m be 1, 2 and 3.

When $m = 1, 2, 3$, we get $5n = 12 - 3m = 9, 6, 3$.

But 9, 6, 3 all cannot be divided by 5.

Hence, we cannot find the integer n which satisfy any of the circumstances.

Hence, it's proved false.