Prove that for any integer n, at least one of the integers $\boldsymbol{n, n+2 \ or \ n+4}$ is divisible by 3.

Again this proposition can be proven by a **direct proof**.

Direct Proof: First if n is divisible by there is no need to look at $n + 2 \ or \ n + 4$, but if n is not divisible by 3, then it is clear that n is either of the form $3m + 1 \ or \ 3m + 2 \ where \ m \in \mathbb{Z}$.

Then if $n = 3m + 1$

$n + 2 = 3m + 3$ which is clearly divisible by 3

Else if $n = 3m + 2$

$n + 4 = 3m + 6$ which is clearly divisible by 3

So this statement is true, concluding the proof.