

## Proof 2

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**Say whether the following is true or false and support your answer by a proof: The sum of any five consecutive integers is divisible by 5 (without remainder).**

### Proof

We want to prove:

$$\begin{aligned}n + (n + 1) + (n + 2) + (n + 3) + (n + 4) &= 5k + 0 \\ &\text{(by the definition of divisibility)}\end{aligned}$$

where  $n, k \in \mathbb{Z}$ .

Now,

$$\begin{aligned}n + (n + 1) + (n + 2) + (n + 3) + (n + 4) &= 5n + 10 \\ &= 5(n + 2) + 0\end{aligned}$$

where  $k = n + 2$ .

Which proves that the sum of any five consecutive integers is divisible by 5. We did it!