We will now prove the following:

Theorem. For any integer n, $n^2 - 1$ is divisible by 3 iff n is **not** divisible by 3.

Idea. Let n be an integer and we write $n = 3k + r$, where r is the **remainder** when we divide n by 3.

Quick question: what possible values does r take? Can you write down a proof by cases?