Wild Conjecture 1. *If x is an even integer and y is an integer, then xy is an even integer.*

Proof. Assuming that x is an even integer and y is an integer, we will prove that xy is an even integer. By definition an even integer x can be written as $x = 2n$ for some integer n. Using this definition and regrouping we see...

$$\begin{aligned} xy &= (2n)y \\ &= 2(ny) \end{aligned}$$

Since the integers are closed under multiplication, ny is an integer, call it p, yielding

$$xy = 2p$$

Since there exists an integer p such that $xy = 2p$, xy is an even integer. We have therefore shown that if x is an even integer and y is an integer, then xy is an even integer. □