

1 Assignment

Theorem 1. *Suppose n is an integer. Then n^2 , when divided by 3, cannot have a remainder of 2.*

Hints: To get used to this theorem before proving it, try some examples (square 1, 2, 3, 4, 5, 6 and 7 and check the remainder). Recall (from your grade school days) that any integer can be written as a multiple of 3 plus a remainder of 0, 1 or 2. (This is kind of analogous to how you write evens as $2k$ and odds as $2k + 1$.) You might want to approach this case-by-case for n 's remainder. For example, if n is a multiple of 3, then what is the remainder when n^2 is divided by 3? What if n has a remainder of 1? Of 2?