

Problems:

1. Section 4.1, exercise 10
2. Section 4.1, exercise 30
3. Prove that 3 divides $n^3 + 2n$ whenever n is a positive integer.
4. Section 4.1, exercise 66
5. Section 4.2, exercise 10
6. Section 4.2, exercise 12
7. Section 4.3, exercise 16
8. If Σ is an alphabet, for $x \in \Sigma^*$ we define the *reversal* of x recursively as follows:
 - **Basis:** $\lambda^R = \lambda$ where λ is the empty string
 - **Recursive step:** $(ua)^R = au^R$ for $a \in \Sigma, u \in \Sigma^*$

Show using structural induction on $x \in \Sigma^*$ that if $w, x \in \Sigma^*$ are two strings in Σ^* then

$$(wx)^R = x^R w^R$$

Please write about how many hours it took you to complete this assignment near where you write your name on the first page.