Practice Problems

1 From the book

- Section 1.1: 1.1, 1.2
- Section 1.2: 1.7, 1.9, 1.10

2 Additional problems

- Show that for any integer n, $2 \mid n(n+1)$ and $3 \mid n(n+1)(n+2)$.
- Show that for any positive integer n, $\gcd(n, n+1) = 1$.
- Show that for any integer n, $\gcd(22n+7, 33n+10) = 1$.
- Can we find integers a and b such that $\gcd(a, b) = 3$ and $a + b = 65$?
- Show that if x and y are odd, then $x^2 + y^2$ cannot be a square.
- Show that if $a \equiv b \pmod{m}$, then $\gcd(a, m) = \gcd(b, m)$.
- List all integers x in the range $1 \leq x \leq 100$ such that $x \equiv 7 \pmod{100}$.
- Show that if n is any odd integer, then $n^2 \equiv 1 \pmod{8}$ or, in other words, 8 divides $n^2 - 1$.