Exercise 1. Textbook exercise 3.1.6(b).

Exercise 2. Textbook exercise 3.1.16.

Exercise 3. Textbook exercise 3.1.17.

Exercise 4. We have shown that every prime number p has the property that if $p|ab$ for some $a, b \in \mathbb{Z}$, then $p|a$ or $p|b$. Prove that the converse is also true. That is, show that if a natural number $p \geq 2$ has the property that $p|ab$ implies $p|a$ or $p|b$, for any $a, b \in \mathbb{Z}$, then p is prime.