Some useful definition about division

Section 1.1: division with remainders
Given an integer a and a positive integer b, there is a quotient q and a remainder r which are integers such that:
- $a = bq + r$
- $0 \leq r < b$

Section 1.2: divisibility

All of these statements mean the same thing (they are interchangeable)
- $a \mid b$
- b is evenly divisible by a
- a divides evenly into b
- a is a factor of b
- a is a divisor of b
- a divides b

They all mean that:
- $a \neq 0$ and
- $b = an$ for some integer n.