

**Section 2.1** Algebraic and Order Properties of  $\mathbb{R}$

Elements of  $\mathbb{R}$  that aren't in  $\mathbb{Q}$  are called irrational numbers.

**Theorem** Let  $a, b \in \mathbb{R}$ .

- a)  $a > b$  and  $b > c \implies a > c$ .
- b)  $a > b \implies a + c > b + c$ .
- c)  $a > b$  and  $c > 0 \implies ac > bc$   
 $a > b$  and  $c < 0 \implies ac < bc$ .

**Theorem** If  $ab > 0$  then

- a)  $a > 0$  and  $b > 0$  OR
- b)  $a < 0$  and  $b < 0$ .