# Exercise 8

*Yes or No*? If *No*, give a reason. Assume that $a$ and $b$ are nonzero real numbers.

(a) Is the distance between any two different real numbers always positive?

(b) Is the distance between $a$ and $b$ the same as the distance between $b$ and $a$?

---

**Solution**

(a) Yes.

(b) Yes.

The formula for the distance between two numbers on the number line is given by

$$d(a, b) = |b - a|.$$

Because of the absolute value sign, $d(a, b)$ is always positive, and the order doesn't matter.

$$d(b, a) = |a - b| = |-(b - a)| = |b - a| = d(a, b)$$