

**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  $a$ ?
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**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.

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