Variant of book's ER 2.2.18a

§2.2
BS4p36

Let $x, y \in \mathbb{R}$ and $x \neq y$. Let:

I be an interval with endpoint x and y

M be the midpoint of x and y

D be the distance between x and y.

1. Visualization.

Since $x \neq y$, we know $\min\{x, y\} < \max\{x, y\}$ and the endpoints of I are $\max\{x, y\}$ and $\min\{x, y\}$.

1a. Express $\max\{x, y\}$ as a function of M and D.

Explain your solution geometrically (not algebraically) by using a well-marked picture.

⟨Your function should have M and D but not x nor y.⟩

1b. Express $\min\{x, y\}$ as a function of M and D.

Explain your solution geometrically (not algebraically) by using a well-marked picture.

⟨Your function should have M and D but not x nor y.⟩

hint. Hint. Draw yourself a picture. Stand on the the midpoint M. From M, how would you get to the upper endpoint of I? From M, how would you get to the lower endpoint of I?

2. Algebraically.

2a. Express $\max\{x, y\}$ as a function of x and y. ⟨Your function should have x and y but not: M, D, max, min.⟩

2b. Express $\min\{x, y\}$ as a function of x and y. ⟨Your function should have x and y but not: M, D, max, min.⟩

hint. Hint. Use **1a** and **1b**.

3. Do your formulas in part **2** hold when $x = y$? Just answer yes or no. No explanation needed.

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