

You are given the following list of the seven numbers: 10, 2, 5, 2, 4, 6, 2. You are asked to choose a positive number as the eighth number so that

- the mean, median, and mode of the eight numbers are distinct, and
- the mean, median, and mode differ by the same amount when put in order from least to greatest.

Determine all possible choices for the eighth number.

