Problem of the Week

Problem E

Arithmetic Tendencies

The mean, median and mode of the eight positive numbers $10, 2, 5, 2, 6, 4, 2, x$ are distinct. The mean, median and mode are calculated and then listed in order from smallest to largest. The differences between adjacent numbers in this new list are equal.

Determine all possible values of x.

The *mean* of a list of numbers is the sum of the numbers in the list divided by the number of numbers in the list.

The *median* of a list of numbers is the middle number in the ordered list of numbers when there is an odd number of numbers in the list. The *median* of a list of numbers is the average of the two middle numbers in the ordered list of numbers when there is an even number of numbers in the list.

The *mode* of a list of numbers is the number occurring most frequently in a list. (If no number is repeated in the list, there is no mode.)