

Let A_1, A_2, \dots, A_8 be a permutation of the integers $1, 2, 3, \dots, 8$. Show that if the sixteen numbers

$$9 \pm A_1, 10 \pm A_2, \dots, 16 \pm A_8$$

are all distinct, then the same is true when the numbers are written in reverse order. That is, the sixteen numbers

$$9 \pm A_8, 10 \pm A_7, \dots, 16 \pm A_1$$

are also distinct.