Two Cubic Equations

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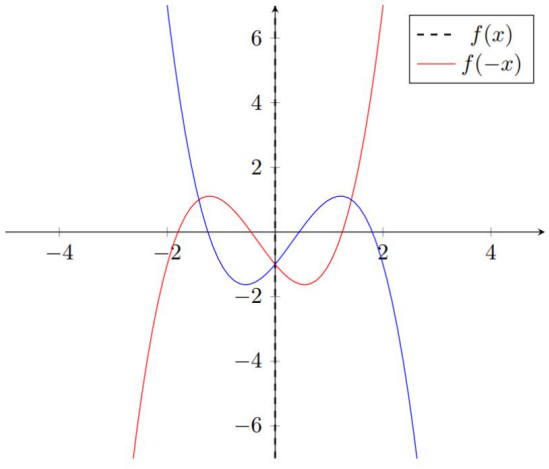
For this problem, I rearranged both equations so they were both in the same form.

$$x^3 + ax^2 - bx - c = 0$$
$$-x^3 + ax^2 + bx - c = 0$$

Rewriting the equations in this form, I noticed that the odd powers of x had their sign swapped.

Calling the first equation $f(x)$, the second can be written as $f(-x)$ which is just a reflection in the y-axis.

What this means for the roots is that all of the negative roots become positive and vice versa as seen below. In this graph there are two negative roots and one positive and as can be seen, the resultant graph has the opposite.



Therefore the answer is B.

Link to NRICH page.