Precalculus
Factor cubic with rational roots using its plot

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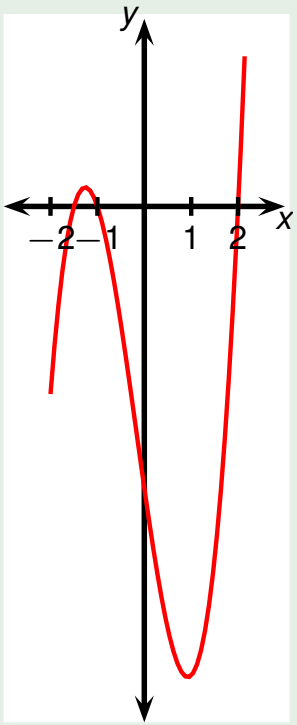
Example



Plot the left hand side of the equation with a graphing calculator. Solve the equation.

$$\begin{aligned} 2x^3 + x^2 - 7x - 6 &= 0 \\ (2x+3)(x+1)(x-2) &= 0 \\ x = -\tfrac{3}{2} \quad \textbf{or} \quad x = -1 \quad \textbf{or} \quad x &= 2 \end{aligned}$$

Make sure to practice with the graphing calculator you will on your exam(s). The graph appears to intersect the x axis at: $-1.5, -1, 2$. The left hand side should factor as:

$$2(x-(-1.5))(x-(-1))(x-2) = (2x+3)(x+1)(x-2)$$

$$= (2x^2+5x+3)(x-2) = (2x^3+5x^2+3x) - (4x^2+10x+6)$$

$$= 2x^3 + x^2 - 7x - 6$$

Check work to make sure we guessed the roots correctly.