# **13.2 – Synthetic Division**

To divide a polynomial by a linear factor, you can use synthetic division.

Steps:

* Write the problem as a division problem. Make sure everything is in standard form.
* Write the problem in synthetic division form. Reverse the sign of the constant term in the linear factor.
* Bring down the first coefficient.
* Multiply the first coefficient by the constant term. Write the result under the next coefficient. Add these together.
* Repeat the steps of multiplying and adding until you have used all coefficients.
* Write the answer using the last number as the remainder.

**Example 1:** Use synthetic division to divide $3x^{3}-4x^{2}+2x-1$ by $x+1$.

**Example 2:** Use synthetic division to divide $x^{3}-13x+12$ by $x+4$.