Synthetic Division

Division Algorithm: If $P(x)$ and $D(x)$ are polynomials and $D(x) \neq 0$, then there exists a unique polynomial $Q(x)$ and R such that

$$P(x) = D(x) \cdot Q(x) + R$$

$$\text{Dividend} = \text{Divisor} \cdot \text{Quotient} + \text{Remainder}$$

Steps for Synthetic Division

1. Set up the synthetic division.
2. Bring down the leading coefficient to the

bottom row.

3. Multiply c by the value just written on the bottom row.
4. Add the column created in step 3.
5. Repeat until done.
6. Write out the answer.