# Synthetic Division

Synthetic division is a shorter method of dividing polynomials.

NB!!

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Synthetic division can be used ONLY where the divisor is a linear polynomial (binomial) with a leading co-efficient of one.

For example:

(i) $x^3 + 2x^2 + 3x - 6$ divided by $x - 1$

In the example above synthetic division can be used because the divisor $(x-1)$ is a binomial and the co-efficient of $x$ in the divisor is 1.

(ii) $2x^3 - 9x^2 + 15$ divided by $2x - 5$

In this example, synthetic division CANNOT BE USED because the co-efficient of $x$ in the divisor is not 1.

(iii) $(4x^3 + 2x + 3x^2 + 1) \div (x^2 + x + 2)$

In this example, synthetic division cannot be used because the divisor $(x^2 + x + 2)$ is a trinomial and not a binomial.