POLYNOMIAL THEOREMS

Why the Remainder Theorem works

Evaluation and division are not separate operations.

Division algorithm

$$P(x) = (x - c) \cdot Q(x) + R$$

DEGREE OF $(x - c)$ IS 1

The remainder is a constant

R has degree less than 1

- Independent of x

SUBSTITUTE $x = c$

Remainder Theorem

$$P(c) = 0 \cdot Q(c) + R = R$$

- The factor $(c - c)$ annihilates the quotient term