

YOU & MATHS **Using tricks** Use tricks to divide each given polynomial by the one proposed without actually setting up the division between polynomials.

- a. Divide $x^6 - 1$ by $x^3 - 1$.
- b. Divide $(s + t)^2 - (s - t)^2$ by $4s$.
- c. Divide $x^3 + 27$ by $x^2 - 3x + 9$.

- a. You can think of the polynomial $x^6 - 1$ as a difference of squares and get:

$$x^6 - 1 = (x^3 - 1)(x^3 + 1).$$

Therefore the division gives $x^3 + 1$.

- b. You can think of the polynomial as a difference of squares and get:

$$(s + t)^2 - (s - t)^2 = (s + t + s - t)[s + t - (s - t)] = (2s)(2t) = 4st.$$

Therefore the division gives t .

- c. You can think of the polynomial $x^3 + 27$ as a sum of cubes and get:

$$x^3 + 27 = (x + 3)(x^2 - 3x + 9).$$

Therefore the division gives $x + 3$.