

Polynomial Division (Section 12.2)

Use long division to find the quotients and remainders. Write each answer in the form $p(x) = d(x) \cdot q(x) + R(x)$

1.

$$\frac{x^3 - 4x^2 + x - 2}{x - 5}$$

Solution:

$$x^3 - 4x^2 + x - 2 = (x - 5)(x^2 + x + 6) + 28$$

2.

$$\frac{3x^2 + 4x - 1}{x - 1}$$

Solution:

$$3x^2 + 4x - 1 = (x - 1)(3x + 7) + 6$$

3.

$$\frac{x^4 - 4x^3 + 6x^2 - 4x + 1}{x - 1}$$

Solution:

$$x^4 - 4x^3 + 6x^2 - 4x + 1 = (x - 1)(x^3 - 3x^2 + 3x - 1)$$

4.

$$\frac{4x^3 - x^2 + 8x - 1}{x^2 - x + 1}$$

Solution:

$$4x^3 - x^2 + 8x - 1 = (x^2 - x + 1)(4x + 3) + (7x - 4)$$

5.

$$\frac{x^6 + 64}{x - 2}$$

Solution:

$$x^6 + 64 = (x - 2)(x^5 + 2x^4 + 4x^3 + 8x^2 + 16x + 32) + 128$$

6.

$$\frac{2t^5 - 6t^4 - t^2 + 2t + 3}{t^3 - 2}$$

Solution:

$$2t^5 - 6t^4 - t^2 + 2t + 3 = (t^3 - 2)(2t^2 - 6) + (3t^2 - 10t + 3)$$