

1. Descomponer en factores:

- a) $x^3 - 6x^2 + 9x = x(x - 3)^2$
- b) $x^3 - x = x(x - 1)(x + 1)$
- c) $x^4 - 81x^2 = x^2(x + 9)(x - 9)$
- d) $x^3 + 2x^2 + x = x(x + 1)^2$
- e) $3x^3 - 27x = 3x(x + 3)(x - 3)$
- f) $3x^2 + 30x + 75 = 3(x + 5)^2$
- g) $x^4 - 50x^2 + 625 = (x + 5)^2(x - 5)^2$
- h) $x^2 - 16 = (x - 4)(x + 4)$
- i) $x^4 - 6x^3 + 9x^2 = x^2(x - 3)^2$
- j) $3x^3 - 3x = 3x(x - 1)(x + 1)$
- k) $2x^4 + 12x^3 + 18x^2 = 2x^2(x + 3)^2$
- l) $5x^2 - 40x + 80 = 5(x - 4)^2$
- m) $3x^3 + 6x^2 + 3x = 3x(x + 1)^2$
- n) $x^4 - 9x^2 = x^2(x - 3)(x + 3)$
- o) $x^4 - 10x^2 + 9 = (x + 1)(x - 1)(x + 3)(x - 3)$

2. Descomponer en factores e indicar cuáles son sus raíces:

- a) $x^2 + 8x - 9 = (x - 1)(x + 9)$ Raíces: **1, -9**
- b) $x^3 - x^2 + 9x - 9 = (x - 1)(x^2 + 9)$ Raíz: **1**
- c) $x^4 + x^2 - 20 = (x - 2)(x + 2)(x^2 + 5)$ Raíces: **2, -2**
- d) $x^3 + x^2 - 5x - 5 = (x + 1)(x - \sqrt{5})(x + \sqrt{5})$ Raíces: **-1, $\sqrt{5}$, $-\sqrt{5}$**
- e) $x^4 - x^3 - 9x^2 + 3x + 18 = (x + 2)(x - 3)(x - \sqrt{3})(x + \sqrt{3})$ Raíces: **-2, 3, $-\sqrt{3}$, $\sqrt{3}$**
- f) $x^4 - 81 = (x - 3)(x + 3)(x^2 + 9)$ Raíces: **3, -3**
- g) $x^4 - x^2 = x^2(x - 1)(x + 1)$ Raíces: **0, 1, -1**
- h) $x^3 + 3x^2 + 4x + 12 = (x + 3)(x^2 + 4)$ Raíz: **-3**
- i) $x^3 - 3x^2 = x^2(x - 3)$ Raíces: **0, 3**
- j) $x^3 - x^2 - 12x = x(x - 4)(x + 3)$ Raíces: **0, 4, -3**
- k) $x^3 - 7x^2 + 14x - 8 = (x - 1)(x - 2)(x - 4)$ Raíces: **1, 2, 4**
- l) $x^4 - 4x^3 + 4x^2 - 4x + 3 = (x - 1)(x - 3)(x^2 + 1)$ Raíces: **1, 3**

3. Factorizar:

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

b) $x^2 + 12x + 35 = (x - 5)(x + 7)$

c) $4x^2 + 8x - 12 = 4(x - 1)(x + 3)$

d) $2x^3 + 2x^2 - 24x = 2x(x - 3)(x + 4)$

e) $x^4 + 9x^3 - 10x^2 = x^2(x - 1)(x + 10)$

f) $3x^3 - 9x^2 - 30x = 3x(x + 2)(x - 5)$

g) $3x^2 + 2x - 8 = (x + 2)(3x - 4) = 3(x + 2)(x - 4/3)$

h) $4x^2 + 17x + 15 = (x + 3)(4x + 5) = 4(x + 3)(x + 5/4)$

i) $2x^2 - 9x - 5 = (x - 5)(2x + 1) = 2(x - 5)(x + 1/2)$

j) $-x^2 + 17x - 72 = (x - 9)(-x + 8) = -1(x - 9)(x - 8)$

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

l) $x^3 - x - 6 = (x - 2)(x^2 + 2x + 3)$

m) $3x^4 + 15x^2 = 3x^2(x^2 + 5)$

n) $x^4 - 16 = (x - 2)(x + 2)(x^2 + 4)$