



NOMBRES Y APELLIDOS:

COMPLETA LOS PROCESOS QUE FALTAN AL FACTORIZAR LOS SIGUIENTES POLINOMIOS

$$\begin{aligned}
 & a^3 + 3a^2b + 3ab^2 + b^3 = \\
 & = (\square^3 + \square^3) + (\square a^2b + \square ab^2) \\
 & = (\square + \square)(a^2 - \square + b^2) + \square(a + b) \\
 & = (a + b)[(a^2 - ab + b^2) + \square] = (a + b)(a^2 + \square + b^2) \\
 & = (\square + \square)(a + b)^2 = (\square + \square)^3
 \end{aligned}$$

$$\begin{aligned}
 & 16x^2y^2 + 12ab - 4a^2 - 9b^2 \\
 & = 16x^2y^2 - 4a^2 + 12ab - 9b^2 \\
 & = 16x^2y^2 - [4a^2 - 12\square + 9b^2] \\
 & = 16x^2y^2 - \underbrace{[(\square)^2 - 2(\square)(\square) + (\square)^2]}_{\text{Trinomio cuadrado perfecto}} \\
 & = 16x^2y^2 - (\square - \square)^2 \\
 & = (\square)^2 - (\square - \square)^2 = [(4xy) + (2a - 3b)][(\square) - (2a - 3b)] \\
 & = (4xy + 2a - 3b)(\square - 2a + 3b)
 \end{aligned}$$

$$\begin{aligned}
 & 9x^2 + 4y^2 - a^2 - 12xy - 25b^2 - 10ab = \\
 & = 9x^2 - 1\square + 4y^2 - a^2 - 1\square - 25b^2 \\
 & = 9x^2 - 12xy + 4y^2 - [a^2 + 10ab + 25b^2] \\
 & = \underbrace{[(\square)^2 - 2(\square)(\square) + (\square)^2]}_{\text{Trinomio cuadrado perfecto}} - \underbrace{[a^2 + 2(\square)(\square) + (5b)^2]}_{\text{Trinomio cuadrado perfecto}}
 \end{aligned}$$

$$\begin{aligned}
 &= (3x - 2y)^2 - (a + 5b)^2 \\
 &= [( \quad - \quad ) + ( \quad + \quad )][(3x - 2y) - (a + 5b)] \\
 &= ( \quad - \quad + \quad + \quad )( \quad - \quad - \quad - \quad )
 \end{aligned}$$

$$\begin{aligned}
 &3ax - ay - 3bx + by = \\
 &= ( \quad - \quad ) - ( \quad - \quad ) = a(3x - y) - b(3x - y) \\
 &= ( \quad - \quad )( \quad - \quad )
 \end{aligned}$$

$$\begin{aligned}
 &x^2 - 4y^2 + x + 2y = \\
 &= (x^2 - \quad^2) + (x + \quad) \\
 &= [x^2 - ( \quad )^2] + (x + \quad) = (x + \quad)(x - \quad) + (x + \quad) \cdot 1 \\
 &= (x + 2y)[(x - 2y) + 1] = (x + 2y)(x - 2y + 1)
 \end{aligned}$$

$$\begin{aligned}
 &x^3 + 6x^2y + 12xy^2 + 8y^3 = \\
 &= (x^3 + \quad^3) + (6x^2y + \quad^2) \\
 &= [x^3 + ( \quad )^3] + \quad (x + \quad) \\
 &= (x + \quad)(x^2 - x( \quad ) + ( \quad )^2) + \quad (x + \quad) \\
 &= (x + 2y)[(x^2 - x( \quad ) + ( \quad )^2) + 6xy] \\
 &= (x + 2y)[x^2 - \quad + 4y^2 + \quad] \\
 &= (x + 2y)[x^2 + \quad + 4y^2] = (x + 2y) \underbrace{[(x)^2 + 2(x)( \quad ) + (2y)^2]}_{\text{Trinomio cuadrado perfecto}} \\
 &= (x + \quad)(x + \quad)^2 = (x + 2y)^3
 \end{aligned}$$

$$\begin{aligned}
 & 9x^4 - 25x^2y^2 + 16y^4 = \\
 & = 9x^4 - 25x^2y^2 + x^2y^2 + 16y^4 - x^2y^2 \\
 & = (9x^4 - 24x^2y^2 + \boxed{\phantom{00}}^4) - x^2y^2 \\
 & = \underbrace{[\boxed{\phantom{00}}^2]^2 - 2[\boxed{\phantom{00}}^2](\boxed{\phantom{00}}^2) + (4y^2)^2}_{\text{trinomio cuadrado perfecto}} - (\boxed{\phantom{00}})^2 \\
 & = ([\boxed{\phantom{00}}^2] - (\boxed{\phantom{00}}^2))^2 - (\boxed{\phantom{00}})^2 \\
 & = [(3x^2 - 4y^2) + (xy)][(3x^2 - 4y^2) - (xy)] \\
 & = (3x^2 + \boxed{\phantom{00}} - 4y^2)(3x^2 - \boxed{\phantom{00}} - 4y^2)
 \end{aligned}$$

Notar que aún se puede seguir factorizando utilizando la regla del aspa.

$$\begin{aligned}
 9x^4 - 25x^2y^2 + 16y^4 &= (3\boxed{x}^2 + y\boxed{x} - 4y^2)(3\boxed{x}^2 - y\boxed{x} - 4y^2) \\
 &\quad \begin{array}{ccc} 1 & \nearrow & -y \\ 3 & \searrow & 4y \end{array} \quad \begin{array}{ccc} 1 & \nearrow & y \\ 3 & \searrow & -4y \end{array} \\
 &= (x - y)(3x + 4y)(x + y)(3x - 4y)
 \end{aligned}$$

$$\begin{aligned}
 a^2 + b^2 &= \underbrace{a^2 + 2ab + b^2}_{(a+b)^2} - \boxed{\phantom{00}} \\
 &= (a + b)^2 - (\sqrt{\boxed{\phantom{00}}})^2 \\
 &= [(a + b) + \sqrt{\boxed{\phantom{00}}}] [(a + b) - \sqrt{\boxed{\phantom{00}}}] \\
 &= (a + b + \sqrt{2ab})(a + b - \sqrt{\boxed{\phantom{00}}})
 \end{aligned}$$