EVALUACIÓN

NOMBRES Y APELLIDOS:

COMPLETA LOS PROCESOS QUE FALTAN AL FACTORIZAR LOS SIGUIENTES POLINOMIOS

$$a^3 + 3a^2b + 3ab^2 + b^3 =$$
$$= (\square^3 + \square^3) + (\square a^2b + \square ab^2)$$
$$= (\square + \square)(a^2 - \square + b^2) + \square(a + b)$$
$$= (a + b)[(a^2 - ab + b^2) + \square] = (a + b)(a^2 + \square + b^2)$$
$$= (\square + \square)(a + b)^2 = (\square + \square)^3$$

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

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

$$= (3x - 2y)^2 - (a + 5b)^2$$
$$= [(\square - \square) + (\square + \square)][(3x - 2y) - (a + 5b)]$$
$$= (\square - \square + \square + \square)(\square - \square - \square - \square)$$

$$3ax - ay - 3bx + by =$$
$$= (\square - \square) - (\square - \square) = a(3x - y) - b(3x - y)$$
$$= (\square - \square)(\square - \square)$$

$$x^2 - 4y^2 + x + 2y =$$
$$= (x^2 - \square^2) + (x + \square)$$
$$= [x^2 - (\square)^2] + (x + \square) = (x + \square)(x - \square) + (x + \square) \cdot 1$$
$$= (x + 2y)[(x - 2y) + 1] = (x + 2y)(x - 2y + 1)$$

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

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

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

$$9x^4 - 25x^2y^2 + 16y^4 = \left(3\boxed{x}^2 + y\boxed{x} - 4y^2\right)\left(3\boxed{x}^2 - y\boxed{x} - 4y^2\right)$$

$$
\begin{array}{ccc}
1 & \times & -y \\
3 & & 4y
\end{array}
\qquad
\begin{array}{ccc}
1 & \times & y \\
3 & & -4y
\end{array}
$$

$$= (x - y)(3x + 4y)(x + y)(3x - 4y)$$

$$
\begin{aligned}
a^2 + b^2 &= \underbrace{a^2 + 2ab + b^2}_{(a+b)^2} - \square \\
&= (a + b)^2 - (\sqrt{\square})^2 \\
&= \left[(a + b) + \sqrt{\square}\right]\left[(a + b) - \sqrt{\square}\right] \\
&= (a + b + \sqrt{2ab})(a + b - \sqrt{\square})
\end{aligned}
$$