

Productos notables

$$\begin{aligned} 1. (x+3)(x+4) &= (x)^2 + (3+4)x + (3)(4) \\ &= x^2 + 7x + 12 \end{aligned}$$

$$\begin{aligned} 2. (x-5)(x+10) &= (x)^2 + (-5+10)x + (-5)(10) \\ &= x^2 + 5x - 50 \end{aligned}$$

$$\begin{aligned} 3. (3x-5)(2x+1) &= 6x^2 + 3x - 10x - 5 \\ &= 6x^2 - 7x - 5 \end{aligned}$$

$$\begin{aligned} 4. (7x-2)(4x-3) &= 28x^2 - 21x - 8x + 6 \\ &= 28x^2 - 29x + 6 \end{aligned}$$

$$\begin{aligned} 5. (x^2 - x + 1)(x^2 + x + 1) &= x^4 + \cancel{x^3} + \cancel{x^2} - \cancel{x^3} - \cancel{x^2} - x + x^2 + x + 1 \\ &= x^4 + x^2 + 1 \end{aligned}$$

$$\begin{aligned} 6. (x^2 + 3x - 2)(x^2 - 3x - 2) &= x^4 - \cancel{3x^3} - 2x^2 + \cancel{3x^3} - 9x^2 - 6x - 2x^2 + 6x + 4 \\ &= x^4 - 13x^2 + 4 \end{aligned}$$

$$7. (x+10)(x-10) = (x)^2 - (10)^2 = x^2 - 100$$

$$\begin{aligned} 8. -(2x+3)(2x-3) &= 4x^2 - 6x + 6x - 9 \\ &= 4x^2 - 9 \end{aligned}$$

$$\begin{aligned} 9. -(x+2y)(x-2y) &= x^2 - (2y)^2 \\ &= x^2 - 4y^2 \end{aligned}$$

$$\begin{aligned} 10. -(2x+3y)(2x-3y) &= (2x)^2 - (3y)^2 \\ &= 4x^2 - 9y^2 \end{aligned}$$

$$\begin{aligned} 11. -(2x+3)^2 &= (2x)^2 + 2(2x)(3) + (3)^2 \\ &= 4x^2 + 12x + 9 \end{aligned}$$

$$\begin{aligned} 12. -(4x+5)^2 &= (4x)^2 + 2(4x)(5) + (5)^2 \\ &= 16x^2 + 40x + 25 \end{aligned}$$

$$\begin{aligned} 13. -(2x-5y)^2 &= (2x)^2 - 2(2x)(5y) + (5y)^2 \\ &= 4x^2 - 20xy + 25y^2 \end{aligned}$$

$$\begin{aligned} 14. -(5-8x)^2 &= (5)^2 - 2(5)(8x) + (8x)^2 \\ &= 25 - 80x + 64x^2 \end{aligned}$$

$$\begin{aligned} 15. - (x+1)^3 &= (x)^3 + 3(x^2)(1) + 3(x)(1^2) + 1^3 \\ &= x^3 + 3x^2 + 3x + 1 \end{aligned}$$

$$\begin{aligned} 16. - (x-2)^3 &= (x)^3 + 3(x^2)(-2) + 3(x)(-2)^2 + (-2)^3 \\ &= x^3 - 6x^2 + 12x - 8 \end{aligned}$$

$$\begin{aligned} 17. - (2x-y)^3 &= (2x)^3 + 3(2x^2)(-y) + 3(2x)(-y^2) + (-y)^3 \\ &= 8x^3 - 12x^2y + 6xy^2 - y^3 \end{aligned}$$

$$\begin{aligned} 18. - (3x+2y)^3 &= (3x)^3 + 3(3x^2)(2y) + 3(3x)(2y^2) + (2y)^3 \\ &= 27x^3 + 54x^2y + 36xy^2 + 8y^3 \end{aligned}$$

$$\begin{aligned} 19. - (4x^3-3)^2 &= (4x^3)^2 - 2(4x^3)(3) + (3)^2 \\ &= 16x^6 - 24x^3 + 9 \end{aligned}$$

$$\begin{aligned} 20. - (8x+3)^2 &= (8x)^2 + 2(8x)(3) + (3)^2 \\ &= 64x^2 + 48x + 9 \end{aligned}$$

$$21. - [(m-3)+n] [(m-3)-n] = m^2 - 3m - \cancel{mn} - 3m + 9 + 3n + \cancel{nm} - 3n - n^2 \\ = m^2 - 6m + 9 - n^2$$

$$22. - [(x+y)+1] [(x+y)-1] = x^2 + xy - \cancel{x} + yx + y^2 - \cancel{x} + \cancel{x} + y - 1 \\ = x^2 + 2xy + y^2 - 1$$

$$23. - [(x-3)+y]^2 = (x-3+y)^2 = (x-3+y)(x-3+y) \\ = x^2 - 3x + xy - 3x + 9 - 3y + yx - 3y + y^2 \\ = x^2 - 6x + 2xy + 9 - 6y + y^2$$

$$24. - [(x+1)-y]^2 = (x+1-y)^2 = (x+1-y)(x+1-y) \\ = x^2 + x - xy + x + 1 - y - yx - y + y^2 \\ = x^2 + 2x - 2xy + 1 - 2y + y^2$$

$$25. - (2r^2-5)(2r^2+5) = (2r^2)^2 - (5)^2 \\ = 4r^4 - 25$$

$$26. - (3a^3-4b^2)(3a^3+4b^2) = (3a^3)^2 - (4b^2)^2 = 9a^6 - 16b^4$$

$$27. - (1.2x + 3)^2 = (1.2x)^2 + 2(1.2x)(3) + (3)^2$$

$$= \frac{36}{25}x^2 + 7.2x + 9$$

$$28. - (1.5y - 3)^2 = (1.5y)^2 + 2(1.5y)(3) + (3)^2$$

$$= \frac{9}{4}y^2 - 9y + 9$$

$$29. - (1.5x - 4)(1.5x + 4) = (1.5x)^2 - (4)^2$$

$$= \frac{9}{4}x^2 - 16$$

$$30. - (2.5y + 3)(2.5y - 3) = (2.5y)^2 - (3)^2$$

$$= \frac{25}{4}y^2 - 9$$

$$31. - 5x(x+1) - 3x(x+1) = 5x - 3x(x+1)$$

$$= 2x(x+1)$$

Factorización

1.- $6y^2 - 4y$

MCD = 2

Factor común = $2y$

$$\frac{6y^2}{2y} = 3y ; \frac{4y}{2y} = 2$$

$$R = 2y(3y - 2)$$

2.- $3x^2y - 9x^3y^3$

MCD = 3

Factor común = $3x^2y$

$$\frac{3x^2y}{3x^2y} = 1 ; \frac{-9x^3y^3}{3x^2y} = -3xy^2$$

$$R = 3x^2y(1 - 3xy^2)$$

3.- $6v^3v^3 + 18v^2vw^4 - 12v^2v^3$

MCD = 6

Factor común = $6v^2v$

$$\frac{6v^3v^3}{6v^2v} = vv^2 ; \frac{18v^2vw^4}{6v^2v} = 3\frac{w^4}{v}$$

$$\frac{-12v^2v^3}{6v^2v} = -2v^2$$

$$R = 6v^2v(vv^2 + 3\frac{w^4}{v} - 2v^2)$$

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

5.- $s^2 - 6s + 8 = (s - 4)(s + 2)$

$$6.. x^2 + 2x - 24 = (x+6)(x-4)$$

$$7.. 4t^2 - 9s^2 = (2t+3s)(2t-3s)$$

$$\sqrt{4t^2} = 2t = \sqrt{9s^2} = 3s$$

$$8.. y^2 - 15y + 50 = (y-5)(y-10)$$

$$9.. 3t^2 + 12t - 15 =$$

$$MC0=3$$

$$\frac{3t^2}{3} = t^2; \quad \frac{12t}{3} = 4t; \quad \frac{-15}{3} = -5$$

$$\text{Factor common} = 3$$

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

$$10.. 9y^2 - 18y + 8 = \frac{9(9y^2 - 18y + 8)}{9} = \frac{81y^2 - 18y + 72}{9}$$

$$MC0=$$

$$81y^2 - 18y + 72 = (9y-6)(9y-12) = \frac{(9y-6)(9y-12)}{3 \cdot 3} = (3y-2)(3y-4)$$

$$\sqrt{8y^2} = 4y$$

$$11.. 4x^2 - x - 3 = \frac{4(4x^2 - x - 3)}{4} = \frac{16x^2 - x - 12}{4}$$

$$16x^2 - x - 12 = \frac{(4x+3)(4x-4)}{4} = (x + \frac{3}{4})(x-1)$$

$$12. -9z^2 + 30z + 25 = 9(z^2 + 30z + 25) = \frac{81z^2 + 30z + 225}{9}$$

$$81z^2 + 30z + 225 = \frac{(9z + 15)(9z + 15)}{9} = \left(z + \frac{5}{3}\right)\left(z + \frac{5}{3}\right)$$

$$13. -x^2y^2 - 4xy + 4 = (xy - 2)^2$$

$$\begin{array}{l} \text{MCQ} = 1 \\ \text{Factor} = xy \quad \sqrt{4} = 2 \end{array} \quad \begin{array}{l} 2(xy)(2) = 4xy \\ \frac{4}{xy} = 4xy \end{array}$$

$$14. -2x^2(2x - 4x^2)^2 = -2x^2((2x - 4x^2)(2x - 4x^2))$$

$$= 4x^2 - 8x^3 - 8x^3 + 16x^4$$

$$= 4x^2 + 16x^3 + 16x^4$$

$$= 2x^2(4x^2 - 16x^3 + 16x^4)$$

$$= 8x^4 - 32x^5 + 32x^6$$

$$\text{MCQ} = 8$$

$$\text{common} = 8x^4$$

$$\frac{8x^4}{8x^4} = 1; \quad \frac{-32x^5}{8x^4} = -4x; \quad \frac{32x^6}{8x^4} = 4x^2$$

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

$$15. - (\underline{5x^2 + 2x}) + (\underline{10x + 4}) = (5x + 2)(x + 2)$$

$$*(\underline{5x + 2}) + 2(\underline{5x + 2})$$

$$16. - (x^2 - 1) + (x^2 - x - 2)$$

$$(x+1)(x-1) + (x+1)(x-2)$$

$$(x+1)(x-1+x-2)$$

$$(x+1)(2x-3)$$

$$17. - x^3y - 4xy + z^2x^2 - 4z^2$$

$$(x^3y - 4xy) + (z^2x^2 - 4z^2)$$

$$x(x^2 - 4) + z^4(x^2 - 4) = (x^2 - 4)(x + z^4)$$

$$18. - x^3 - 1 = (x-1)(x^2 - x + 1) = (x-1)(x^2 - x + 1)$$

$$\sqrt[3]{x^3} = x \quad \sqrt[3]{1} = 1$$

$$19. - 27 + 8x^3 = (3 + 2x)(27^2 - (27)(2) + (8x^3)^2) = (3 + 2x)(729 - 216 + 64x^6)$$

$$\sqrt[3]{27} = 3 \quad \sqrt[3]{8} = 2$$

$$20. - (a+s)^3 (a+1)^2 + (a+s)^2 (a+1)^3$$

$$\underline{(a+1)^2} \underline{(a+s)^2} \underline{(a+s)} + \underline{(a+1)^2} \underline{(a+1)} \underline{(a+s)^2}$$

$$(a+s)^2 (a+1)^2 (a+s+a+1)$$

$$(2a+6)$$

$$= 2 (a+s)^2 (a+1)^2 (a+3)$$

$$21. \ 81x^4 - y^4 = (9x^2 + y^2)(9x^2 - y^2)$$

$$\sqrt[2]{81x^4} = 9x^2 \quad \sqrt[2]{y^4} = y^2$$

$$22. \ t^4 - 4 = (t^2 + 2)(t^2 - 2)$$

$$\sqrt{t^4} = t^2 \quad \sqrt{4} = 2$$

$$23. \ x^4 - 10x^2 + 9 = (x^2 - 1)(x^2 - 9)$$

$$\sqrt{x^4} = x^2 \quad \sqrt{9} = 3$$