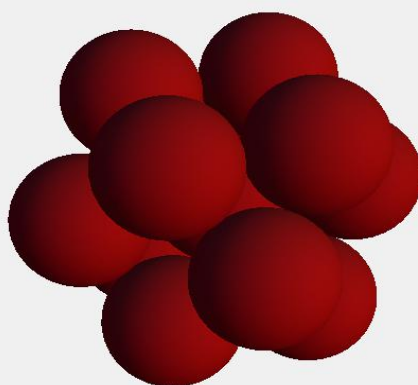


MathCon

The Mathematics Firm

Factorización

Problemas sobre factorización



www.math.com.mx

José de Jesús Angel Angel
jjaa@math.com.mx

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Capítulo 1

Factorización

1.1. Factorizar las siguientes expresiones algebraicas como producto de dos binomios.

- | | |
|------------------------------------|----------------------------|
| 1. $144 + 16n + 9x + nx.$ | Sol: $(9 + n)(16 + x).$ |
| 2. $285 + 19c + 15x + cx.$ | Sol: $(15 + c)(19 + x).$ |
| 3. $-102 - 6b + 17c + bc.$ | Sol: $(17 + b)(-6 + c).$ |
| 4. $156 + 13f + 12x + fx.$ | Sol: $(12 + f)(13 + x).$ |
| 5. $-3y + ey - 3z + ez.$ | Sol: $(-3 + e)(y + z).$ |
| 6. $32 + 8b + 4y + by.$ | Sol: $(4 + b)(8 + y).$ |
| 7. $-30 + 15m - 2n + mn.$ | Sol: $(-2 + m)(15 + n).$ |
| 8. $-10 + 2e - 5z + ez.$ | Sol: $(-5 + e)(2 + z).$ |
| 9. $8c + 8n + cn + n^2.$ | Sol: $(8 + n)(c + n).$ |
| 10. $19b + bn + 19z + nz.$ | Sol: $(19 + n)(b + z).$ |
| 11. $12c + c^2 + 12y + cy.$ | Sol: $(12 + c)(c + y).$ |
| 12. $bx^2 + x^3 + bz + xz.$ | Sol: $(b + x)(x^2 + z).$ |
| 13. $cx + x^2 + cy + xy.$ | Sol: $(c + x)(x + y).$ |
| 14. $-7y + by - 7xy + bxy.$ | Sol: $(-7 + b)(y + yx).$ |
| 15. $132 + 11b + 12yz + byz.$ | Sol: $(12 + b)(11 + yz).$ |
| 16. $-30 + 6b - 5xz + bxz.$ | Sol: $(-5 + b)(6 + xz).$ |
| 17. $x^3y + x^3z + xy^2z + xyz^2.$ | Sol: $x(y + z)(x^2 + yz).$ |
| 18. $-48 - 8y + 6xy + xy^2.$ | Sol: $(6 + y)(-8 + xy).$ |
| 19. $16 + 2x^2 + 8yz + x^2yz.$ | Sol: $(8 + x^2)(2 + yz).$ |
| 20. $-2e + ae - 2xz + axz.$ | Sol: $(-2 + a)(e + xz).$ |
| 21. $-32 - 4x^2 + 8y + x^2y.$ | Sol: $(8 + x^2)(-4 + y).$ |

22. $ay^2 + ayz + x^2y^2z + x^2yz^2$.

Sol: $y(y+z)(a+x^2z)$.

23. $4e + exz + 4yz + xyz^2$.

Sol: $(4+xz)(e+yz)$.

24. $-x - xy^2 + x^2z + x^2y^2z$.

Sol: $x(1+y^2)(-1+xz)$.

25. $3e + ex + 3y^2 + xy^2$.

Sol: $(3+x)(e+y^2)$.

26. $136 + 17b + 8xy + bxy$.

Sol: $(8+b)(17+xy)$.

27. $bx^3 + by + x^3z^2 + yz^2$.

Sol: $(x^3+y)(b+z^2)$.

28. $17x^3 + bx^3 + 17xz + bxz$.

Sol: $(17+b)x(x^2+z)$.

29. $169 + 13b + 13xz + bxz$.

Sol: $(13+b)(13+xz)$.

30. $2yz + xyz + 2xz^2 + x^2z^2$.

Sol: $(2+x)z(y+xz)$.

31. $boxy + bz + x^2y^2z + xyz^2$.

Sol: $(xy+z)(b+xyz)$.

32. $240 + 12x + 20xz + x^2z$.

Sol: $(20+x)(12+xz)$.

33. $2x + x^3 + 2z + x^2z$.

Sol: $(2+x^2)(x+z)$.

34. $135 + 9y + 15xy + xy^2$.

Sol: $(15+y)(9+xy)$.

35. $6x^2z + 6yz + x^2yz + y^2z$.

Sol: $(6+y)(x^2+y)z$.

36. $-4x^2 - 4xz + x^2z + xz^2$.

Sol: $x(-4+z)(x+z)$.

37. $-39 + 13a - 3xz + axz$.

Sol: $(-3+a)(13+xz)$.

38. $13y + cy + 13y^2 + cy^2$.

Sol: $(13+c)y(1+y)$.

39. $112 + 7b + 16xz + bxz$.

Sol: $(16+b)(7+xz)$.

40. $boxy + fx^2z + xyz^2 + x^2z^3$.

Sol: $x(y+xz)(f+z^2)$.

41. $-104 - 8f + 13x^2 + fx^2$.

Sol: $(13+f)(-8+x^2)$.

42. $-28 + 14xy - 2yz + xy^2z$.

Sol: $(-2+xy)(14+yz)$.

43. $190 + 19a + 10xz + axz$.

Sol: $(10+a)(19+xz)$.

44. $-9a - 9b + axz + bxz$.

Sol: $(a+b)(-9+xz)$.

45. $30 + 6x + 5yz + xyz$.

Sol: $(5+x)(6+yz)$.

46. $6x^3 + x^5 + 6yz + x^2yz$.

Sol: $(6+x^2)(x^3+yz)$.

47. $238 + 14b + 17x^2 + bx^2$.

Sol: $(17+b)(14+x^2)$.

48. $2c + cxy + 2x^2y + x^3y^2$.

Sol: $(2+xy)(c+x^2y)$.

49. $20x^2z + ax^2z + 20yz + ayz$.

Sol: $(20+a)(x^2+y)z$.

50. $14yz + xyz + 14z^2 + xz^2$.

Sol: $(14+x)z(y+z)$.

51. $-6y - 6x^2y + yz + x^2yz$.

Sol: $(1+x^2)y(-6+z)$.

52. $8 - 2x^2 - 4xz + x^3z$.

Sol: $(-4+x^2)(-2+xz)$.

53. $153 + 17xy + 9yz + xy^2z$.

Sol: $(9+xy)(17+yz)$.

54. $12x^2 + x^3y^2 + 12xyz + x^2y^3z$.

Sol: $x(12+xy^2)(x+yz)$.

55. $a\sqrt{y} + y^{5/2} + az + y^2z$. Sol: $(a + y^2)(\sqrt{y} + z)$.
56. $17x + x\sqrt{y} + 17x^2y + x^2y^{3/2}$. Sol: $x(17 + \sqrt{y})(1 + xy)$.
57. $b\sqrt{y} + y^{5/2} + bxz^2 + xy^2z^2$. Sol: $(b + y^2)(\sqrt{y} + xz^2)$.
58. $8/x + b/x + 8z^2 + bz^2$. Sol: $((8 + b)(1 + xz^2))/x$.
59. $(xy)/z + 1/\sqrt{z} + xyz^2 + z^{5/2}$. Sol: $((xy + \sqrt{z})(1 + z^3))/z$.
60. $b/x + bx^2 + yz + x^3yz$. Sol: $((1 + x^3)(b + xyz))/x$.
61. $b + b\sqrt{y} + z^2 + \sqrt{y}z^2$. Sol: $(1 + \sqrt{y})(b + z^2)$.
62. $19/y + 19\sqrt{z} + (xz^2)/y + xz^{5/2}$. Sol: $((1 + y\sqrt{z})(19 + xz^2))/y$.
63. $bx + bx^2 + x/y + x^2/y$. Sol: $(x(1 + x)(1 + by))/y$.
64. $2\sqrt{z} + xy\sqrt{z} + 2xyz + x^2y^2z$. Sol: $(2 + xy)(1 + xy\sqrt{z})\sqrt{z}$.
65. $91 + 7/y + 13x^2z + (x^2z)/y$. Sol: $((1 + 13y)(7 + x^2z))/y$.
66. $y^3/x + y^5 + z^2/x + y^2z^2$. Sol: $((1 + xy^2)(y^3 + z^2))/x$.
67. $c\sqrt{x} + cx^2 + \sqrt{x}z^2 + x^2z^2$. Sol: $\sqrt{x}(1 + x^{3/2})(c + z^2)$.
68. $140 + 10/y + 14\sqrt{z} + \sqrt{z}/y$. Sol: $((1 + 14y)(10 + \sqrt{z}))/y$.
69. $c\sqrt{y} + y^{3/2} + cx^2z + x^2yz$. Sol: $(c + y)(\sqrt{y} + x^2z)$.
70. $5/y + 1/\sqrt{y} + 5x^2y + x^2y^{3/2}$. Sol: $((5 + \sqrt{y})(1 + x^2y^2))/y$.
71. $a\sqrt{y} + xy^{3/2} + ay^3 + xy^4$. Sol: $(a + xy)(\sqrt{y} + y^3)$.
72. $13\sqrt{x} + x^{5/2}y + 13yz + x^2y^2z$. Sol: $(13 + x^2y)(\sqrt{x} + yz)$.
73. $x/y + xy + (xz)/y + xyz$. Sol: $(x(1 + y^2)(1 + z))/y$.
74. $10b + 10/y + b\sqrt{z} + \sqrt{z}/y$. Sol: $((1 + by)(10 + \sqrt{z}))/y$.
75. $x^{3/2} + x^3z + x^{3/2}z^2 + x^3z^3$. Sol: $x^{3/2}(1 + x^{3/2}z)(1 + z^2)$.
76. $3\sqrt{x} + x^{5/2}y + 3xz^2 + x^3yz^2$. Sol: $\sqrt{x}(3 + x^2y)(1 + \sqrt{x}z^2)$.
77. $1/\sqrt{y} + 15\sqrt{y} + xz + 15xyz$. Sol: $((1 + 15y)(1 + x\sqrt{y}z))/\sqrt{y}$.
78. $1/y + \sqrt{x}/y + z^3 + \sqrt{x}z^3$. Sol: $((1 + \sqrt{x})(1 + yz^3))/y$.
79. $15\sqrt{x} + 15\sqrt{z} + \sqrt{x}yz + yz(3/2)$. Sol: $(\sqrt{x} + \sqrt{z})(15 + yz)$.
80. $1 + (x^2y)/z + x^2yz^2 + z^3$. Sol: $((x^2y + z)(1 + z^3))/z$.
81. $11\sqrt{y} + 11z^3 + \sqrt{y}z^3 + z^6$. Sol: $(11 + z^3)(\sqrt{y} + z^3)$.
82. $3x^2 + x^2\sqrt{z} + 3xz^2 + xz^{5/2}$. Sol: $x(3 + \sqrt{z})(x + z^2)$.
83. $-3x^2 + x^2\sqrt{y} - 3y^2 + y^{5/2}$. Sol: $(-3 + \sqrt{y})(x^2 + y^2)$.
84. $-7\sqrt{x} + \sqrt{xy}^2 - 7yz + y^3z$. Sol: $(-7 + y^2)(\sqrt{x} + yz)$.
85. $11\sqrt{x} + 11x^3 + x^{3/2}z^2 + x^4z^2$. Sol: $(\sqrt{x} + x^3)(11 + xz^2)$.
86. $x^5y^3 + xy^3\sqrt{z} + x^6z + x^2z^{3/2}$. Sol: $x(x^4 + \sqrt{z})(y^3 + xz)$.
87. $x^{5/2} + x^4y^2 + x^{5/2}z + x^4y^2z$. Sol: $x^{5/2}(1 + x^{3/2}y^2)(1 + z)$.

88. $-4\sqrt{y} - 4x^2y + xy^{3/2}z + x^3y^2z$. Sol: $(1 + x^2\sqrt{y})\sqrt{y}(-4 + xyz)$.
89. $3y^4 + x^3y^4 + 3z^2 + x^3z^2$. Sol: $(3 + x^3)(y^4 + z^2)$.
90. $x^3yz + xy^2z + x^3z^2 + xyz^2$. Sol: $x(x^2 + y)z(y + z)$.
91. $-6x^2y^2 + x^4y^2 - 6xz + x^3z$. Sol: $x(-6 + x^2)(xy^2 + z)$.
92. $6 - x^2y - 6xyz + x^3y^2z$. Sol: $(-6 + x^2y)(-1 + xyz)$.
93. $-5\sqrt{y} + \sqrt{y}\sqrt{z} - 5z^2 + z^{5/2}$. Sol: $(-5 + \sqrt{z})(\sqrt{y} + z^2)$.
94. $x^3\sqrt{y} + xy^{5/2} + x^3/z + (xy^2)/z$. Sol: $(x(x^2 + y^2)(1 + \sqrt{y}z))/z$.
95. $b\sqrt{x} + bx^3y + \sqrt{x}z + x^3yz$. Sol: $\sqrt{x}(1 + x^{5/2}y)(b + z)$.
96. $19/x + y^2 + 19xyz^2 + x^2y^3z^2$. Sol: $((19 + xy^2)(1 + x^2yz^2))/x$.
97. $-6x^2 + x^4y - 6\sqrt{z} + x^2y\sqrt{z}$. Sol: $(-6 + x^2y)(x^2 + \sqrt{z})$.
98. $6\sqrt{z} + c\sqrt{z} + 6x^2yz + cx^2yz$. Sol: $(6 + c)(1 + x^2y\sqrt{z})\sqrt{z}$.
99. $-9b - 9\sqrt{y} + bxy^2 + xy^{5/2}$. Sol: $(b + \sqrt{y})(-9 + xy^2)$.
100. $7/x + 7x^2y + 1/(xz) + (x^2y)/z$. Sol: $((1 + x^3y)(1 + 7z))/(xz)$.