

Aufgaben zu den binomischen Formeln

1.0 Ergänzen Sie zu einer vollständigen binomischen Formel.

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| 1.1 $(x+\square)^2 = \square + \square + 49$ ☐ | 1.2 $(\square+5c)^2 = \square + 30bc + \square$ ☒ | 1.3 $(\square+3)^2 = 4a^2 + \square + \square$ ☐ |
| 1.4 $(4c+\square)^2 = \square + \square + 25a^2$ ☐ | 1.5 $(\square+2r)^2 = 16s^2 + \square + \square$ ☐ | 1.6 $(ab+\square)^2 = \square + 4abc + \square$ ☒ |
| 1.7 $(2a-\square)^2 = \square - \square + 9b^2$ ☐ | 1.8 $(\square-g)^2 = \square - 4dg + \square$ ☒ | 1.9 $(\square-3y)^2 = x^4 - \square + \square$ ☐ |
| 1.10 $(\square-2)^2 = a^2 - \square + \square$ ☐ | 1.11 $(\square-4y)^2 = 9x^2 - \square + \square$ ☐ | 1.12 $(6a-\square)^2 = \square - 4ab + \square$ ☒ |

2.0 Wenden Sie die binomischen Formeln an und vereinfachen Sie. ☐

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|--------------------------|-------------------------------------|--|
| 2.1 $(x+5)^2 - x^2 - 25$ | 2.2 $(x-9)^2 - 81 - x^2$ | 2.3 $(3y+2x)^2 - 4x^2 + 6xy$ |
| 2.4 $6x + (3-x)^2$ | 2.5 $a^2 + b^2 + (a+b) \cdot (a-b)$ | 2.6 $81 + (5x-9) \cdot (5x+9) - 25x^2$ |

3.0 Beachten Sie die Minusklammern und vereinfachen Sie. ☒

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|--------------------------------|-------------------------------|-----------------------------------|
| 3.1 $8x - (4x-1)^2$ | 3.2 $9a^2 + 4b^2 - (3a-2b)^2$ | 3.3 $16x^2 - (1-4x) \cdot (1+4x)$ |
| 3.4 $81 - (9-2v) \cdot (9+2v)$ | 3.5 $12xy - (3x+y)^2$ | 3.6 $y^2 - (x-y)^2 - x^2$ |

4.0 Lösen Sie die Klammern auf und vereinfachen Sie. ☒

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|----------------------------|-----------------------------------|--------------------------------------|
| 4.1 $(1+x)^2 + (1-x)^2$ | 4.2 $(y-7)^2 - (y-7)^2$ | 4.3 $(2u+v)^2 - (2u-v)^2$ |
| 4.4 $(a+b)^2 - (a^2+b^2)$ | 4.5 $(a+4)^2 - (a-1) \cdot (a+1)$ | 4.6 $(y+7z) \cdot (y-7z) - (y-7z)^2$ |
| 4.7 $(x+2y-z) \cdot (y-z)$ | 4.8 $(2+a) \cdot (2a-b-5)$ | |

Lösungen

$$1.1 \quad (x+7)^2 = x^2 + 14x + 49$$

$$1.2 \quad (3b+5c)^2 = 9b^2 + 30bc + 25c^2$$

$$1.3 \quad (2a+3)^2 = 4a^2 + 12a + 9$$

$$1.4 \quad (4c+5a)^2 = 16c^2 + 40ac + 25a^2$$

$$1.5 \quad (4s+2r)^2 = 16s^2 + 16sr + 4r^2$$

$$1.6 \quad (ab+2c)^2 = (ab)^2 + 4abc + 4c^2$$

$$1.7 \quad (2a-3b)^2 = 4a^2 - 12ab + 9b^2$$

$$1.8 \quad (2d-g)^2 = 4d^2 - 4dg + g^2$$

$$1.9 \quad (x^2-3y)^2 = x^4 - 6x^2y + 9y^2$$

$$1.10 \quad (a-2)^2 = a^2 - 4a + 4$$

$$1.11 \quad (3x-4y)^2 = 9x^2 - 24xy + 16y^2$$

$$1.12 \quad \left(6a - \frac{1}{3}b\right)^2 = 36a^2 - 4ab + \frac{1}{9}b^2$$

$$2.1 \quad x^2 + 10x + 25 - x^2 - 25 = 10x$$

$$2.2 \quad x^2 - 18x + 81 - 81 - x^2 = -18x$$

$$2.3 \quad 9y^2 + 12xy + 4x^2 - 4x^2 + 6xy = 9y^2 + 18xy$$

$$2.4 \quad 6x + 9 - 6x + x^2 = 9 + x^2$$

$$2.5 \quad a^2 + b^2 + a^2 - b^2 = 2a^2$$

$$2.6 \quad 81 + 25x^2 - 81 - 25x^2 = 0$$

$$3.1 \quad 8x - 16x^2 + 8x - 1 = -16x^2 + 16x - 1$$

$$3.2 \quad 9a^2 + 4b^2 - 9a^2 + 12ab - 4b^2 = 12ab$$

$$3.3 \quad 16x^2 - 1 + 16x^2 = 32x^2 - 1$$

$$3.4 \quad 81 - 81 + 4v^2 = 4v^2$$

$$3.5 \quad 12xy - 9x^2 - 6xy - y^2 = -9x^2 + 6xy - y^2$$

$$3.6 \quad y^2 - x^2 + 2xy - y^2 - x^2 = -2x^2 + 2xy$$

$$4.1 \quad 1 + 2x + x^2 + 1 - 2x + x^2 = 2x^2 + 2$$

$$4.2 \quad y^2 - 14y + 49 - y^2 + 14y - 49 = 0$$

$$4.3 \quad 4u^2 + 4uv + v^2 - (4u^2 - 4uv + v^2) = 4u^2 + 4uv + v^2 - 4u^2 + 4uv - v^2 = 8uv$$

$$4.4 \quad a^2 + 2ab + b^2 - a^2 - b^2 = 2ab$$

$$4.5 \quad a^2 + 8a + 16 - (a^2 - 1) = a^2 + 8a + 16 - a^2 + 1 = 8a + 17$$

$$4.6 \quad y^2 - 49z^2 - (y^2 - 14yz + 49z^2) = y^2 - 49z^2 - y^2 + 14yz - 49z^2 = -98z^2 + 14yz$$

$$4.7 \quad xy - xz + 2y^2 - 2yz - zy + z^2 = xy - xz + 2y^2 - 3yz + z^2$$

$$4.8 \quad 4a - 2b - 10 + 2a^2 - ab - 5a = -a - 2b - 10 + 2a^2 - ab$$