

$$\textcircled{1} \text{ a) } 2 - 2(-4 - (-5)) = \\ = 2 - 2(-4 + 5) = 2 - 2 \cdot 1 = \underline{\underline{0}}$$

$$\text{b) } -(-7a - 7) + (-3a - 5) - 2 \\ = 7a + 7 - 3a - 5 - 2 = \underline{\underline{4a}}$$

$$\text{c) } -2a + 2 - (b - (-2 + 4a)) + 2b \\ = -2a + 2 - (b + 2 - 4a) + 2b \\ = \underline{-2a} + \underline{2} - \underline{b} - \underline{2} + \underline{4a} + \underline{2b} = \underline{\underline{2a + b}}$$

$$\text{d) } x - (y - (z - x) + (-z + (-x))) \\ = x - (y - z + x - z - x) \\ = \underline{x} - \underline{y} + \underline{z} - \underline{x} + \underline{z} + \underline{x} = \underline{\underline{x - y + 2z}}$$

$$\text{e) } a + b - (c - (a + b) - (a - c)) + a - 2b \\ = \underline{a + b} - \underline{(c - a - b - a + c)} \\ = a + b - (c - a - b - a + c) + a - 2b \\ = \underline{a + b} - \underline{(c - a - b + a - c + a)} - 2b \\ = a + b - (a - b) - 2b \\ = a + b - a + b - 2b = \underline{\underline{0}}$$

$$\textcircled{2} \quad a) \quad (-a)^3 = (-1 \cdot a)^3 = (-1)^3 \cdot a^3 = \underline{\underline{-a^3}}$$

$$b) \quad -x^2 \cdot (-x)^2 \cdot (-x^2) \\ = -x^2 \cdot x^2 \cdot (-x^2) = \underline{\underline{x^6}}$$

$$c) \quad (-2y)^2 (-2y^2) = 4y^2 \cdot (-2y^2) = \underline{\underline{-8y^4}}$$

$$d) \quad (-(-z)^5)^2 = (-(-z^5))^2 = (z^5)^2 = \underline{\underline{z^{10}}}$$

↳ Vorzeichen irrelevant; am Schluss wird quadriert, also ist Vorzeichen sicher. ⊕

$$\textcircled{3} \quad a) \quad 6a^2 + 18ab + 5a + 15b \\ = 6a(a+3b) + 5(a+3b) \\ = \underline{\underline{(6a+5)(a+3b)}}$$

$$b) \quad 2y^2 + 10y + 3xy + 15x \\ = 2y(y+5) + 3x(y+5) \\ = \underline{\underline{(3x+2y)(y+5)}}$$

$$\textcircled{4} \quad a) \quad (a^2b + 3c)^2 = (a^2b)^2 + 2 \cdot a^2b \cdot 3c + (3c)^2 \\ = \underline{\underline{a^4b^2 + 6a^2bc + 9c^2}}$$

$$b) \quad (-x - 3y^3)^2 = (-x + (-3y^3))^2 \\ = (-x)^2 + 2 \cdot (-x) \cdot (-3y^3) + (-3y^3)^2 \\ = \underline{\underline{x^2 + 6xy^3 + 9y^6}}$$

$$\textcircled{5} \quad a) \quad a^2 - 10a + 25 = (a - 5)^2$$

$$b) \quad x^2 - 7x + 12 = \underline{(x - 3)(x - 4)}$$

$$c) \quad 5p^3q - 5pq^3 = 5pq(p^2 - q^2) \\ = \underline{5pq(p + q)(p - q)}$$

$$d) \quad 8a^2x^2b + 16a^2bxy + 8a^2y^2b \\ = 8a^2b(x^2 + 2xy + y^2) \\ = \underline{8a^2b(x + y)^2}$$

$$e) \quad 16r^2 - \frac{1}{9}s^2 = \underline{(4r - \frac{1}{3}s)(4r + \frac{1}{3}s)}$$

$$f) \quad a^4 + 2a^2b + b^2 = \underline{(a^2 + b)^2}$$

$$g) \quad x^2 - 10x + 21 = \underline{(x - 3)(x - 7)}$$

$$h) \quad 9a^2 - 30ab + 25b^2 = \underline{(3a - 5b)^2}$$

$$i) \quad 2x^2 - 7x - 15 = (2x \begin{matrix} +3 \\ 5 \\ 1 \\ 15 \end{matrix}) (x \begin{matrix} -5 \\ 3 \\ 15 \\ 1 \end{matrix}) \\ = \underline{(2x + 3)(x - 5)}$$

$$k) \quad 3a^2 - 10a - 8 = (3a \begin{matrix} +2 \\ 4 \\ 1 \\ 8 \end{matrix}) (a \begin{matrix} -4 \\ 2 \\ 8 \\ 1 \end{matrix}) \\ = \underline{(3a + 2)(a - 4)}$$

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$$x(x-10) + 50 = 29$$

$$x^2 - 10x + 21 = 0$$

$$(x-3)(x-7) = 0$$

$$\underline{\underline{x_1 = 3, x_2 = 7}}$$