Mathematik 1

Repetition Terme und Potenzen

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1 Übung Repetition Terme und Potenzen

Wenn nichts anderes vermerkt, sollen die Terme vereinfacht oder ausgerechnet werden.

- $-[2a - b \cdot (a - 2b) + ab] = -[2a - ab + 2b^2 + ab] = -2a - 2b^2$
- $e \cdot (3e^2 - 4) - 2 \cdot (e^3 - e^2 - 2e) = 3e^3 - 4e - 2e^3 + 2e^2 + 4e = e^3 + 2e^2$
- $\dfrac{-2x^2 - 4xy - 2y^2}{x + y} = \dfrac{-2 \cdot (x^2 + 2xy + y^2)}{x + y} = \dfrac{-2 \cdot (x + y) \cdot (x + y)}{(x + y)} = -2x - 2y$
- $\dfrac{(a^2 - 1) \cdot (2 - a) \cdot (-a^2)}{a \cdot (a - 2) \cdot (a + 1)} = \dfrac{(a + 1) \cdot (a - 1) \cdot (2 - a) \cdot (-1) \cdot a^2}{a \cdot (-1) \cdot (2 - a) \cdot (a + 1)} = a \cdot (a - 1)$
- $(s - t)^3 = 1s^3 - 3s^2 \cdot t + 3st^2 - t^3$

Nr. $6 - 12$: faktorisieren

- $ac - bd + bc - ad = a \cdot (c - d) + b(c - d) = (c - d) \cdot (a + b)$
- $x^3 - x^2 + y^2 \cdot (x - 1) = x^2 \cdot (x - 1) + y^2 \cdot (x - 1) = (x - 1) \cdot (x^2 + y^2)$
- $4x^2 - 36y^2 = (2x + 6y) \cdot (2x - 6y)$
- $-9u^2 + 49z^2 = 49z^2 - 9u^2 = (7z + 3u) \cdot (7z - 3u)$
- $a^2 - 9a + 20 = (a - 5) \cdot (a - 4)$
- $x^2 + x - 42 = (x + 7) \cdot (x - 6)$
- $z^4 - 1 = (z^2 - 1) \cdot (z^2 + 1) = (z - 1) \cdot (z + 1) \cdot (z^2 + 1)$

Nr. $13 - 16$: hier ist kürzen angesagt

- $\dfrac{ax + bx}{ay + by} = \dfrac{x \cdot (a + b)}{y \cdot (a + b)} = \dfrac{x}{y}$
- $\dfrac{a^2 + 5a - 24}{a^2 - 5a + 6} = \dfrac{(a + 8) \cdot (a - 3)}{(a - 2) \cdot (a - 3)} = \dfrac{a + 8}{a - 2}$

- $\dfrac{rs+r+s+1}{rt+t+r+1} = \dfrac{r\cdot(s+1)+1\cdot(s+1)}{t\cdot(r+1)+1\cdot(r+1)} = \dfrac{(s+1)\cdot(r+1)}{(r+1)\cdot(t+1)} = \dfrac{s+1}{t+1}$

- $\dfrac{p^3-2p^2+p}{pq-q} = \dfrac{p\cdot(p^2-2p+1}{q\cdot(p-1} = \dfrac{p\cdot(p-1)\cdot(p-1)}{q\cdot(p-1)} = \dfrac{p\cdot(p-1)}{q}$

- $\dfrac{6a}{5c} - \dfrac{11a}{15c} = \dfrac{3\cdot 6a}{3\cdot 5c} - \dfrac{11a}{15c} = \dfrac{18a-11a}{15} = \dfrac{7a}{15c}$

- $\dfrac{w^2}{w-2} - w = \dfrac{w^2}{w-2} - w\cdot\dfrac{(w-2)}{(w-2)} = \dfrac{w^2-w^2+2w}{w-2} = \dfrac{2w}{w-2}$

- $\dfrac{a}{a+b} + \dfrac{b}{a-b} = \dfrac{a}{(a+b)}\cdot\dfrac{(a-b)}{(a-b)} + \dfrac{b}{(a-b)}\cdot\dfrac{(a+b)}{(a+b)} = \dfrac{a^2-ab+ab+b^2}{(a+b)\cdot(a-b)} = \dfrac{a^2+b^2}{a^2-b^2}$

- $\dfrac{3b^2-3bc}{c} \div (6b-6c) = \dfrac{3b(b-c)}{c}\cdot\dfrac{1}{6\cdot(b-c)} = \dfrac{3b}{6c} = \dfrac{b}{2c}$