

FBM 1E, Do, 12.12.13

① a) $-z^2 \cdot (-z^2) = (-z^2)^2 = \underline{\underline{z^4}}$

b) $-(-x^2)^3 = -(-x^6) = \underline{\underline{x^6}}$

② a) $(-1)^n \cdot (-1)^{n+1} = (-1)^{2n+1} = \underline{\underline{-1}}$ ($2n+1$ ungerade)

b) $(-1)^{-n} (-1)^{2n} (-1)^{n+2} = (-1)^{2n+2} = \underline{\underline{1}}$
Gerade Zahl

③ $\frac{m+13}{m^2+4m-6} - \frac{m+1}{m^2-3m+2}$

$= \frac{m+13}{(m+3)(m-2)} - \frac{m+1}{(m-1)(m-2)}$ / erw. mit gem. Nenner
 $(m+3)(m-1)(m-2)$

$= \frac{(m+13)(m-1) - (m+1)(m+3)}{(m+3)(m-2)(m-1)}$

$= \frac{m^2 + 12m - 13 - (m^2 + 4m + 3)}{(m+3)(m-2)(m-1)}$

$= \frac{8m - 16}{(m+3)(m-2)(m-1)} = \frac{8(m-2)}{(m+3)(m-2)(m-1)}$

$= \frac{8}{(m+3)(m-1)}$

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$$a) \frac{5}{x^2-9} - \frac{3}{x^2-6x+9} = 0$$

$$\frac{5}{(x-3)(x+3)} - \frac{3}{(x-3)^2} = 0 \quad | \cdot (x-3)^2(x+3)$$

$$5(x-3) - 3(x+3) = 0$$

$$5x - 15 - 3x - 9 = 0$$

$$2x - 24 = 0$$

$$\underline{\underline{x = 12}}$$

$$D = \mathbb{R} \setminus \{-3\}$$

$$b) \frac{6}{3m^2-6m} = \frac{10m}{12m-6m^2} + \frac{7}{9m}$$

$$\frac{6}{3m(m-2)} = \frac{10m}{6m(2-m)} + \frac{7}{9m}$$

$$\frac{6}{3}$$

$$\frac{2}{m(m-2)} = -\frac{5}{3(m-2)} + \frac{7}{9m} \quad | \cdot 9m(m-2)$$

$$18 = -15m + 7(m-2)$$

$$18 = -15m + 7m - 14 \quad | +14$$

$$32 = -8m \quad | : (-8)$$

$$\underline{\underline{-4 = m}}$$

$$D = \mathbb{R} \setminus \{0, 2\}$$

$$(5) \quad a) \quad \frac{x^{-2}}{x^{-5}} = x^{-2} \cdot x^5 = \underline{\underline{x^3}}$$

$$b) \quad \frac{a^2 b^{-3} c^4}{a^2 b^{-4} c^3} = a^2 b^{-3} c^4 \cdot a^{-2} b^4 c^{-3} = \underline{\underline{bc}}$$

$$(6) \quad a) \quad \underline{\underline{(xy)^{-3}}} \quad b) \quad \underline{\underline{7wx^3z^{-3}}}$$

$$(7) \quad a) \quad x^7 - x^5 = x^5(x^2 - 1) = \underline{\underline{x^5(x+1)(x-1)}}$$

$$b) \quad x^{2n} - y^{2m} = (x^n)^2 - (y^m)^2 \\ = \underline{\underline{(x^n + y^m)(x^n - y^m)}}$$

$$(8) \quad a) \quad \frac{a^7 - a^5 + a^3}{a^3} = a^4 - a^2 + 1 \\ = \underline{\underline{a^2(a^2 - 1) + 1}}$$

$$b) \quad \frac{s^7 + s^4}{s^3 + 1} = \frac{s^4(s^3 + 1)}{s^3 + 1} = \underline{\underline{s^4}}$$

$$\textcircled{9} \quad a) \quad \frac{(xy)^{-5}}{\left(\frac{x}{y}\right)^{-5}} = (xy)^{-5} \cdot \left(\frac{x}{y}\right)^5$$

$$= x^{-5} y^{-5} \cdot x^5 \cdot y^{-5} = \underline{\underline{y^{-10}}}$$

$$b) \quad \frac{(a-b)^{-7}}{(a^2-b^2)^{-7}} = \frac{(a-b)^{-7}}{((a-b)(a+b))^{-7}}$$

$$= \frac{(a-b)^{-7}}{(a-b)^{-7} (a+b)^{-7}} = \underline{\underline{(a+b)^7}}$$