

Lösungen S. 122 Nr. 7, 9, 11

7) a) kurz gesagt: bei negativen Exponenten darf die Basis nicht 0 sein und bei Brüchen darf im Nenner keine 0 stehen

$$b) \frac{x^4}{x^3} = x^{4-3} = x \quad (x \neq 0)$$

$$(2) \frac{(-5)^{-2}}{(-5)^2} = (-5)^{-2-2} = (-5)^{-4} = \frac{1}{(-5)^4} \quad b \neq 0$$

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

$$(4) \frac{(xy)^2}{(xy)^{-3}} = (xy)^{2-(-3)} = (xy)^5 \quad (x, y \neq 0)$$

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

$$9) a) 3p^2 \cdot 4p^5 = \underline{\underline{12p^7}} \quad b) \frac{8x^4}{2x^{-1}} = 4x^{4-(-1)} = \underline{\underline{4x^5}} \quad (x \neq 0)$$

$$c) 4x \cdot 5x^2y = \underline{\underline{20x^3y}} \quad d) \frac{3x^{-7}}{6x^{-8}} = 0,5x^{-7-(-8)} = 0,5x \quad (x \neq 0)$$

$$e) 7a^{-3} \cdot 5a^{-2} = \underline{\underline{35a^{-5}}} \quad (a \neq 0) \quad f) \frac{14y^2}{21xy^{-3}} = \frac{2}{3}xy^{2-(-3)} = \underline{\underline{\frac{2}{3}xy^5}} \quad (xy \neq 0)$$

$$g) 2ab^{-3} \cdot 3a^{-4}b^2 = 6a^{-3}b^{-1} \quad ((ab) \neq 0)$$

$$h) \frac{4xy^{-2}z^3}{2x^{-2}y^{-2}z} = 2x^{1-(-2)}y^{-2-(-2)}z^{3-1} = 2x^3y^0z^2 = \underline{\underline{2x^3z^2}} \quad (xyz \neq 0)$$

$$11) a) 0,3^{\frac{1}{2}} \cdot 0,3^{\frac{1}{5}} = 0,3^{\frac{1}{2}+\frac{1}{5}} = 0,3^{\frac{5}{10}+\frac{2}{10}} = 0,3^{\frac{7}{10}} = \sqrt[10]{0,3^7}$$

$$b) \sqrt[3]{5} \cdot \sqrt{5} = 5^{\frac{1}{3}} \cdot 5^{\frac{1}{2}} = 5^{\frac{1}{3}+\frac{1}{2}} = 5^{\frac{2}{6}+\frac{3}{6}} = 5^{\frac{5}{6}} = \sqrt[6]{5^5}$$

$$c) \sqrt[5]{x^3} \cdot \sqrt{x^2} = x^{\frac{3}{5}} \cdot x^{\frac{2}{5}} = x^{\frac{3}{5}+\frac{2}{5}} = x^{\frac{5}{5}} = \underline{\underline{x}} \quad (x \geq 0)$$

$$d) \frac{\sqrt[4]{3^3}}{\sqrt{3}} = 3^{\frac{3}{4}} : 3^{\frac{1}{2}} = 3^{\frac{3}{4}-\frac{2}{4}} = 3^{\frac{1}{4}} = \sqrt[4]{3}$$

$$e) \frac{y}{\sqrt{y}} = y^1 : y^{\frac{1}{2}} = y^{1-\frac{1}{2}} = y^{\frac{1}{2}} = \underline{\underline{\sqrt{y}}} \quad (y > 0)$$