

Teil 3

$$1c) \frac{1}{2}(x-1) = \frac{1}{4}(2x+12) \quad | \cdot 4$$

$$2 \cancel{4} \cdot \frac{1}{\cancel{2}}(x-1) = \cancel{4} \cdot \frac{1}{\cancel{4}}(2x+12)$$

$$2(x-1) = 2x+12$$

$$2x-2 = 2x+12$$

$$| -2x ; +2$$

$$0 = 14 \quad \downarrow$$

Teil 4

$$d) (3x-6)^2 + x^2 = 5x^2 + 2 + 5x^2$$

$$9x^2 - 36x + 36 + x^2 = 10x^2 + 2$$

$$10x^2 - 36x + 36 = 10x^2 + 2$$

$$| -10x^2 ; -36$$

$$-36x = -34$$

$$| : (-36)$$

$$x = \frac{17 \cancel{36}}{\cancel{36} 18} = \frac{17}{18}$$

Teil 5

$$1c) \frac{2}{5} + (-\frac{1}{5}z) + \frac{3}{5} = 9$$

$$\frac{2+3}{5} + (-\frac{1}{5}z) = 9$$

$$1 \cdot \frac{5}{5} - \frac{1}{5}z = 9 \quad | -1$$

$$-\frac{1}{5}z = 8 \quad | \cdot (-5)$$

$$\underline{z = -40}$$

$$d) 3x - (-2x + 15) = -35x$$

$$3x + 2x - 15 = -35x$$

$$5x - 15 = -35x \quad | +35x ; +15$$

$$40x = 15 \quad | :40$$

$$x = \frac{15}{40} = \frac{3}{8}$$

Teil 2 Faktorisieren

$$a) 16a^2 + 20ab = 4 \cdot 4a^2 + 4 \cdot 5ab = 4 \cdot a \cdot 4a + 4 \cdot a \cdot 5b \\ = 4a(4a + 5b)$$

$$b) ab + ab^2 + a^2b = ab \cdot 1 + ab \cdot b + ab \cdot a \\ = ab(1 + b + a)$$

$$c) 12x^2 - 12y^2 = 12(x^2 - y^2) = 12(x+y)(x-y)$$

$$12(x^2 - xy + xy - y^2) = [(x+y)(x-y)] \cdot 12$$

$$d) 3a^2 + 6a + 3 = 3 \cdot a \cdot a + 3 \cdot 2a + 3 \cdot 1 \\ (\sqrt{3}a + \sqrt{3})^2 \\ = 3(a^2 + 2a + 1) = 3(a+1)^2$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

Kürzen Sie soweit wie möglich:

$$a) \frac{32ax^2 - 44a^2x + 96a^2x^2}{24a^2\sqrt{2}} = \frac{\cancel{4ax} \cdot 8x - \cancel{4ax} \cdot 11a + \cancel{4ax} \cdot 24ax}{\cancel{4ax} \cdot 6ax}$$

$$a) \frac{32ax^2 - 44a^2x + 96a^2x^2}{24a^2x^2} = \frac{\cancel{4ax} \cdot 8x - \cancel{4ax} \cdot 11a + \cancel{4ax} \cdot 24ax}{\cancel{4ax} \cdot 6ax}$$

$$= \frac{\cancel{4ax}(8x - 11a + 24ax)}{\cancel{4ax} \cdot 6ax} = \frac{8x - 11a + 24ax}{6ax}$$

$$= \frac{\cancel{4} \cancel{8x}}{\cancel{3} \cancel{6ax}} - \frac{11a}{\cancel{6ax}} + \frac{\cancel{4} \cancel{24ax}}{\cancel{6ax}} = \frac{4}{3a} - \frac{11}{6x} + 4$$

$$\frac{12ab + 48a^2 - 72}{48ab^2} = \frac{\cancel{12} \cdot ab + \cancel{12} \cdot 4a^2 - \cancel{12} \cdot 6}{\cancel{12} \cdot 4ab^2}$$

$$= \frac{ab + 4a^2 - 6}{4ab^2}$$

$$= \frac{\cancel{a}b}{\cancel{4}ab^2} + \frac{\cancel{4}a^2}{\cancel{4}ab^2} - \frac{\cancel{3}\cancel{6}}{\cancel{2}\cancel{4}ab^2} = \frac{1}{4b} + \frac{a}{b^2} - \frac{3}{2ab^2}$$