

Lösung A

$$3 \quad 1a) = 3(a^2 - 4a + 4) + a^2 - 4 = 4a^2 - 12a + 8$$

$$4 \quad b) = x^2 - \frac{1}{4}(x^2 - 36) - 3(\frac{1}{4}x^2 + x + 1) \\ = x^2 - \frac{1}{4}x^2 + 9 - \frac{3}{4}x^2 - 3x - 3 = -3x + 6$$

$$4,5 \quad 2a) = (\frac{3}{4}a - 1)^2$$

$$4,5 \quad b) = 10x(4y^2 - 20y + 25) = 10x(2y - 5)^2$$

$$2 \quad 3a) = \frac{4a(3x - 4y)}{4axy} = \frac{3x - 4y}{xy}$$

$$2 \quad b) = \frac{(x+3)^2}{(3+x)(3-x)} = \frac{x+3}{3-x}$$

$$2 \quad c) = \frac{b(b^2 - 1)}{b+1} = \frac{b(b+1)(b-1)}{b+1} = b(b-1)$$

$$3 \quad 4a) \quad \frac{x-2}{3} + 1 = \frac{x}{2} \quad | \cdot 6 \Leftrightarrow$$

$$(x-2) \cdot 2 + 6 = x \cdot 3 \Leftrightarrow 2x + 2 = 3x \quad | -2x \Leftrightarrow x = 2$$

$$4 \quad b) \quad 2x(\frac{1}{2}x - 5) - \frac{3}{4}x^2 = (\frac{1}{2}x - 3)^2 \Leftrightarrow$$

$$x^2 - 10x - \frac{3}{4}x^2 = \frac{1}{4}x^2 - 3x + 9 \quad | -\frac{1}{4}x^2$$

$$\Leftrightarrow -10x = -3x + 9 \quad | +3x$$

$$\Leftrightarrow -7x = 9 \quad | :(-7) \Leftrightarrow x = -\frac{9}{7}$$

$$5 \quad 5) \quad x \cdot (x+5) + 66 = (x+3)(x+8) \Leftrightarrow$$

$$x^2 + 5x + 66 = x^2 + 11x + 24 \quad | -x^2 \quad | -5x \quad | -24$$

$$\Leftrightarrow 42 = 6x \quad | :6 \Leftrightarrow x = 7$$

Die Seiten sind 7 und 12 cm lang.

$$3 \quad 6a) \quad A = 20 \cdot 2 + \frac{20+4}{2} \cdot 18 = 256 \text{ (m}^2\text{)} \quad \left[\text{oder: } A = 20 \cdot 20 - \frac{16 \cdot 18}{2} \right]$$

$$2 \quad b) \quad A_2 = 400 - 256 = 144 \quad \frac{144}{400} = 0,36 = 36\%$$

$$4 \quad c) \quad A = 20 \cdot x + \frac{20+2x}{2} \cdot (20-x) = 20x + (10+x)(20-x)$$

$$= 20x + 200 + 10x - x^2 = 200 + 30x - x^2$$

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$$x \leq 10 \quad (2x \text{ höchstens } 20)$$