Lineare Gleichungssysteme Aufgabe 35

$$x + 3y = a^2 + 3ab + b^2 \quad (1)$$
$$3x - y = a^2 - ab + b^2 \quad (2)$$

$$x + 3y = a^2 + 3ab + b^2$$
$$3x - y = a^2 - ab + b^2 \quad | *3$$

$$x + 3y = a^2 + 3ab + b^2$$
$$\underline{9x - 3y = 3a^2 - 3ab + 3b^2}$$
$$10x = 4a^2 + 4b^2$$

$$10x = 4(a^2 + b^2) \quad | :10$$

$$x = \frac{4}{10}(a^2 + b^2)$$

$$\mathbf{x = \frac{2}{5}(a^2 + b^2)}$$

x in (2) eingesetzt

$$3 * \frac{2}{5}(a^2 + b^2) - y = a^2 - ab + b^2 \quad | *5$$

$$6(a^2 + b^2) - 5y = 5a^2 - 5ab + 5b^2$$

$$6a^2 + 6b^2 - 5y = 5a^2 - 5ab + 5b^2 \quad | +5y$$

$$6a^2 + 6b^2 = 5y + 5a^2 - 5ab + 5b2 \quad | -5a^2$$

$$a^2 + 6b^2 = 5y - 5ab + 5b^2 \quad | -5b^2$$

$$a^2 + b^2 = 5y - 5ab \quad | +5ab$$

$$a^2 + 5ab + b^2 = 5y \quad | :5$$

$$\mathbf{y = \frac{1}{5}(a^2 + 5ab + b^2)}$$