

# Übungen – quadratische Gleichungen (Lösung)

## A1

- a)  $x^2 = 25 \Rightarrow x_1 = 5; x_2 = -5$
- b)  $x^2 + 3 = 1 \Leftrightarrow x^2 = -2 \Rightarrow \mathbb{L} = \{ \}$
- c)  $(x - 10)^2 = 49 \quad | \sqrt{\quad}$   
 $x - 10 = 7 \Rightarrow x_1 = 17$   
 $x - 10 = -7 \Rightarrow x_2 = 3$
- d)  $x^2 + 8x + 16 = 100 \quad | \text{bin. Formel}$   
 $(x + 4)^2 = 100 \quad | \sqrt{\quad}$   
 $x + 4 = 10 \Rightarrow x_1 = 6$   
 $x + 4 = -10 \Rightarrow x_2 = -14$
- e)  $x^2 - 2x = 10 \quad | \text{Ausklammern}$   
 $x(x - 2) = 0 \Rightarrow x_1 = 0; x_2 = 2$

## A2

- a)  $x^2 - 12x + 36 = 0$   
 $p = -12; q = 36 \Rightarrow D = 0$   
 $x = -\frac{(-12)}{2} = 6$
- b)  $x^2 + 4x + 2 = 0$   
 $p = 4; q = 2 \Rightarrow D = 2$   
 $x_{1/2} = -2 \pm \sqrt{2}$
- c)  $x^2 + 10x = 11 \quad | -11$   
 $x^2 + 10x - 11 = 0$   
 $p = 10; q = -11 \Rightarrow D = 36$   
 $x_1 = 1; x_2 = -11$
- d)  $5x^2 + 10x + 5 = 0 \quad | :5$   
 $x^2 + 2x + 1 = 0$   
 $p = 2; q = 1 \Rightarrow D = 0$   
 $x = -1$
- e)  $2x^2 + 4x - 10 = 2 \quad | -2$   
 $2x^2 + 4x - 12 = 0 \quad | :2$   
 $x^2 + 2x - 6 = 0$   
 $p = 2; q = -6 \Rightarrow D = 7$   
 $x_{1/2} = -1 \pm \sqrt{7}$

## A3

$$7,5^2 = x^2 + 4,5^2 \Rightarrow x = \sqrt{7,5^2 - 4,5^2} = 6$$

## A4

$$p = -4; q = -k$$
$$D = \frac{(-4)^2}{4} + k = 0 \Leftrightarrow k = -4$$
$$x^2 - 4x + 4 = 0 \Rightarrow x = 2$$