PQ-Formel: 15 Aufgaben

Arbeitsblatt · erst selbst lösen, Lösungen ab Seite 3

Name: _____ Datum: _____

01 $x^2 + 3x + 2 = 0$ — Leicht

p = _____ q = _____ D = _____

02 $x^2 - 4x + 3 = 0$ — Leicht

p = _____ q = _____ D = _____

03 $x^2 + 6x + 8 = 0$ — Leicht

p = _____ q = _____ D = _____

04 $x^2 - 5x + 4 = 0$ — Leicht

p = _____ q = _____ D = _____

05 $x^2 + 2x - 3 = 0$ — Leicht

p = _____ q = _____ D = _____

06 $x^2 - 4x + 4 = 0$ — Mittel

p = _____ q = _____ D = _____

07 $x^2 + 2x + 1 = 0$ — Mittel

p = _____ q = _____ D = _____

08 $x^2 - 3x - 10 = 0$ — Mittel

p = _____ q = _____ D = _____

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09 $x^2 + 7x + 12 = 0$ — Mittel

p = _____ q = _____ D = _____

10 $x^2 - 2x + 2 = 0$ — Mittel

p = _____ q = _____ D = _____

11 $x^2 + 4x + 5 = 0$ — Mittel

p = _____ q = _____ D = _____

12 $x^2 - 6x + 7 = 0$ — Schwer

p = _____ q = _____ D = _____

13 $x^2 + 3x - 5 = 0$ — Schwer

p = _____ q = _____ D = _____

14 $3x^2 - 12x + 9 = 0$ — Schwer

p = _____ q = _____ D = _____

15 $2x^2 + 8x + 6 = 0$ — Schwer

p = _____ q = _____ D = _____

Lösungen und Rechenweg

Normalform: $x^2 + px + q = 0$; $x_{1,2} = -p/2 \pm \sqrt{D}$

01 **$x^2 + 3x + 2 = 0$**

$p = 3, q = 2$; $D = (3/2)^2 - (2) = 1/4$

$x_1 = -1$; $x_2 = -2$

02 **$x^2 - 4x + 3 = 0$**

$p = -4, q = 3$; $D = (-2)^2 - (3) = 1$

$x_1 = 3$; $x_2 = 1$

03 **$x^2 + 6x + 8 = 0$**

$p = 6, q = 8$; $D = (3)^2 - (8) = 1$

$x_1 = -2$; $x_2 = -4$

04 **$x^2 - 5x + 4 = 0$**

$p = -5, q = 4$; $D = (-5/2)^2 - (4) = 9/4$

$x_1 = 4$; $x_2 = 1$

05 **$x^2 + 2x - 3 = 0$**

$p = 2, q = -3$; $D = (1)^2 - (-3) = 4$

$x_1 = 1$; $x_2 = -3$

06 **$x^2 - 4x + 4 = 0$**

$p = -4, q = 4$; $D = (-2)^2 - (4) = 0$

$D = 0$: $x_1 = x_2 = 2$ (Doppellösung).

07 **$x^2 + 2x + 1 = 0$**

$p = 2, q = 1$; $D = (1)^2 - (1) = 0$

$D = 0$: $x_1 = x_2 = -1$ (Doppellösung).

08 **$x^2 - 3x - 10 = 0$**

$p = -3, q = -10$; $D = (-3/2)^2 - (-10) = 49/4$

$x_1 = 5$; $x_2 = -2$

Lösungen und Rechenweg

Normalform: $x^2 + px + q = 0$; $x_{1,2} = -p/2 \pm \sqrt{D}$

09 **$x^2 + 7x + 12 = 0$**

$p = 7, q = 12$; $D = (7/2)^2 - (12) = 1/4$

$x_1 = -3$; $x_2 = -4$

10 **$x^2 - 2x + 2 = 0$**

$p = -2, q = 2$; $D = (-1)^2 - (2) = -1$

$D < 0$: keine reellen Lösungen.

11 **$x^2 + 4x + 5 = 0$**

$p = 4, q = 5$; $D = (2)^2 - (5) = -1$

$D < 0$: keine reellen Lösungen.

12 **$x^2 - 6x + 7 = 0$**

$p = -6, q = 7$; $D = (-3)^2 - (7) = 2$

$x_1 = 3 + \sqrt{2} \approx 4{,}414$; $x_2 = 3 - \sqrt{2} \approx 1{,}586$

13 **$x^2 + 3x - 5 = 0$**

$p = 3, q = -5$; $D = (3/2)^2 - (-5) = 29/4$

$x_1 = (-3 + \sqrt{29})/2 \approx 1{,}193$; $x_2 = (-3 - \sqrt{29})/2 \approx -4{,}193$

14 **$3x^2 - 12x + 9 = 0$**

Durch 3 teilen: $x^2 - 4x + 3 = 0$

$p = -4, q = 3$; $D = (-2)^2 - (3) = 1$

$x_1 = 3$; $x_2 = 1$

15 **$2x^2 + 8x + 6 = 0$**

Durch 2 teilen: $x^2 + 4x + 3 = 0$

$p = 4, q = 3$; $D = (2)^2 - (3) = 1$

$x_1 = -1$; $x_2 = -3$