# abc-Formel (Mitternachtsformel)

Stufe 2: Bruch-Lösungen

Name: _____ Datum: _____

Löse die Gleichungen mit der abc-Formel: x = (–b ± Wurzel (b² – 4ac)) : (2a). Bringe sie vorher in die Form ax² + bx + c = 0.

1) $5x^2 - 8x - 21 = 0$ _____

2) $4x^2 + 14x + 6 = 0$ _____

3) $5x^2 + 23x - 10 = 0$ _____

4) $2x^2 + 9x + 9 = 0$ _____

5) $2x^2 - 5x - 3 = 0$ _____

6) $4x^2 - 5x - 6 = 0$ _____

7) $3x^2 - 8x - 16 = 0$ _____

8) $3x^2 + 8x + 4 = 0$ _____

9) $3x^2 - 16x + 21 = 0$ _____

10) $3x^2 - 11x + 6 = 0$ _____

11) $2x^2 + 3x - 14 = 0$ _____

12) $2x^2 + 5x - 3 = 0$ _____

13) $4x^2 + 22x + 24 = 0$ _____

14) $5x^2 + 31x + 30 = 0$ _____

15) $3x^2 + 17x + 20 = 0$ _____

16) $5x^2 - 31x + 30 = 0$ _____

17) $4x^2 + 25x + 25 = 0$ _____

18) $3x^2 - 2x - 21 = 0$ _____

19) $5x^2 - 3x - 2 = 0$ _____

20) $2x^2 + 3x - 35 = 0$ _____

21) $5x^2 - 14x - 3 = 0$ _____

22) $5x^2 - 11x - 12 = 0$ _____

23) $2x^2 - 17x + 35 = 0$ _____

24) $5x^2 - 23x - 10 = 0$ _____

25) $2x^2 - 7x + 3 = 0$ _____

26) $2x^2 + 5x + 2 = 0$ _____

27) $4x^2 - x - 3 = 0$ _____

28) $2x^2 + x - 21 = 0$ _____

29) $2x^2 - x - 21 = 0$ _____

30) $4x^2 + 21x + 5 = 0$ _____

31) $4x^2 - 14x + 12 = 0$ _____

32) $2x^2 + 3x = 0$ _____

33) $5x^2 - 17x + 6 = 0$ _____

34) $5x^2 - 13x + 6 = 0$ _____

# Lösungen: abc-Formel (Mitternachtsformel)

Stufe 2: Bruch-Lösungen

**1)** $5x^2 - 8x - 21 = 0 \Rightarrow x_1 = -\frac{7}{5},\ x_2 = 3$

**2)** $4x^2 + 14x + 6 = 0 \Rightarrow x_1 = -3,\ x_2 = -\frac{1}{2}$

**3)** $5x^2 + 23x - 10 = 0 \Rightarrow x_1 = -5,\ x_2 = \frac{2}{5}$

**4)** $2x^2 + 9x + 9 = 0 \Rightarrow x_1 = -3,\ x_2 = -\frac{3}{2}$

**5)** $2x^2 - 5x - 3 = 0 \Rightarrow x_1 = -\frac{1}{2},\ x_2 = 3$

**6)** $4x^2 - 5x - 6 = 0 \Rightarrow x_1 = -\frac{3}{4},\ x_2 = 2$

**7)** $3x^2 - 8x - 16 = 0 \Rightarrow x_1 = -\frac{4}{3},\ x_2 = 4$

**8)** $3x^2 + 8x + 4 = 0 \Rightarrow x_1 = -2,\ x_2 = -\frac{2}{3}$

**9)** $3x^2 - 16x + 21 = 0 \Rightarrow x_1 = \frac{7}{3},\ x_2 = 3$

**10)** $3x^2 - 11x + 6 = 0 \Rightarrow x_1 = \frac{2}{3},\ x_2 = 3$

**11)** $2x^2 + 3x - 14 = 0 \Rightarrow x_1 = -\frac{7}{2},\ x_2 = 2$

**12)** $2x^2 + 5x - 3 = 0 \Rightarrow x_1 = -3,\ x_2 = \frac{1}{2}$

**13)** $4x^2 + 22x + 24 = 0 \Rightarrow x_1 = -4,\ x_2 = -\frac{3}{2}$

**14)** $5x^2 + 31x + 30 = 0 \Rightarrow x_1 = -5,\ x_2 = -\frac{6}{5}$

**15)** $3x^2 + 17x + 20 = 0 \Rightarrow x_1 = -4,\ x_2 = -\frac{5}{3}$

**16)** $5x^2 - 31x + 30 = 0 \Rightarrow x_1 = \frac{6}{5},\ x_2 = 5$

**17)** $4x^2 + 25x + 25 = 0 \Rightarrow x_1 = -5,\ x_2 = -\frac{5}{4}$

**18)** $3x^2 - 2x - 21 = 0 \Rightarrow x_1 = -\frac{7}{3},\ x_2 = 3$

**19)** $5x^2 - 3x - 2 = 0 \Rightarrow x_1 = -\frac{2}{5},\ x_2 = 1$

**20)** $2x^2 + 3x - 35 = 0 \Rightarrow x_1 = -5,\ x_2 = \frac{7}{2}$

**21)** $5x^2 - 14x - 3 = 0 \Rightarrow x_1 = -\frac{1}{5},\ x_2 = 3$

**22)** $5x^2 - 11x - 12 = 0 \Rightarrow x_1 = -\frac{4}{5},\ x_2 = 3$

**23)** $2x^2 - 17x + 35 = 0 \Rightarrow x_1 = \frac{7}{2},\ x_2 = 5$

**24)** $5x^2 - 23x - 10 = 0 \Rightarrow x_1 = -\frac{2}{5},\ x_2 = 5$

**25)** $2x^2 - 7x + 3 = 0 \Rightarrow x_1 = \frac{1}{2},\ x_2 = 3$

**26)** $2x^2 + 5x + 2 = 0 \Rightarrow x_1 = -2,\ x_2 = -\frac{1}{2}$

**27)** $4x^2 - x - 3 = 0 \Rightarrow x_1 = -\frac{3}{4},\ x_2 = 1$

**28)** $2x^2 + x - 21 = 0 \Rightarrow x_1 = -\frac{7}{2},\ x_2 = 3$

**29)** $2x^2 - x - 21 = 0 \Rightarrow x_1 = -3,\ x_2 = \frac{7}{2}$

**30)** $4x^2 + 21x + 5 = 0 \Rightarrow x_1 = -5,\ x_2 = -\frac{1}{4}$

**31)** $4x^2 - 14x + 12 = 0 \Rightarrow x_1 = \frac{3}{2},\ x_2 = 2$

**32)** $2x^2 + 3x = 0 \Rightarrow x_1 = -\frac{3}{2},\ x_2 = 0$

**33)** $5x^2 - 17x + 6 = 0 \Rightarrow x_1 = \frac{2}{5},\ x_2 = 3$

**34)** $5x^2 - 13x + 6 = 0 \Rightarrow x_1 = \frac{3}{5},\ x_2 = 2$