

Herzlich willkommen zur Demo der mathepower.de – Aufgabensammlung

Um sich schnell innerhalb der ca. 350.000 Mathematikaufgaben zu orientieren,
benutzen Sie unbedingt das

Lesezeichen

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Gleichungen – Klammer mal Zahl

1. a) $7(x - 2) = 49$
c) $15(8x - 24) = 120$
e) $12(5x - 2) = 48 + 12x$
2. a) $23(2x + 5) = 6x + 315$
c) $16(2x - 3) = 5(4x + 16) + 4$
e) $13(20 - 5x) = 15(30 - 5x)$
3. a) $5(3x - 4) = 7(2x - 3)$
c) $8(3x - 5) = 60 + 20x$
e) $3(x + 6) + 2(x + 1) = 40$
4. a) $5x - 4(2 - 3x) = 22 + 7x$
c) $18q + 3 = 3(6,1q - 5)$
e) $4(x + 9) - 34 = 2(x - 4) + 11$
5. a) $13 + 2(3x - 2) = 3$
c) $3(5 - 2x) - 8 = 24 - 5(2x + 1)$
e) $6x + 5 = 2(4x - 1) - 7$
6. a) $(x + 3) \cdot 7 = 28$
c) $(2x - 8) \cdot 7 = 98$
e) $11 \cdot (2x - 19) = 121$
7. a) $(3x + 6) \cdot 2 = 3 \cdot (4x - 2)$
c) $11(x + 2) = 7(2x - 2)$
e) $(10 - 2x) \cdot 3 = (3x + 9) \cdot 2$
8. a) $6(5 - x) - 3(x - 4) = 6$
c) $10 - 3(5 - 4x) = 15x + 40$
e) $9(4 - 6x) = -20 - (3 - 5x)$
9. a) $3(x + 2) = 2(x + 1) - 5$
c) $4(2x + 8) - 3(x + 4) = 5$
e) $5(3x - 2) + 7(2x - 4) - 3(x + 1) = 11$
10. a) $7(5x - 3) - 4(2x + 8) = 1$
c) $14(5x + 8) + 4(-2x + 3) = 3(2x + 4)$
e) $3x - 4(2x - 2) + 6 = -2(x + 5)$
11. a) $5(3x - 7) - 3(6x + 8) = 6(12 - x) + 1$
b) $14 + 12(2x - 8) = 5(18 + 4x)$
c) $18 - 15(3x + 2) - 6(2x - 1) = 4(9 - 12x) + 3$
d) $16 + 4(2x - 36) - 18x = 5(-4x + 22) + 2$
e) $3(2x + 9) - 9(4 + x) = 3(5 + x) - 2(x + 6)$
f) $4(x - 8) + 7(14 - x) = 5(x + 9) - 2(x + 10) - 1$
- b) $7(5x + 2) + 9 = 58$
d) $6(3x - 25) = 12$
f) $3(4x + 18) = 6x + 108$
- b) $17(5x + 3) = 401 + 35x$
d) $12(8x - 25) = 5(16x + 40) - 20$
f) $14(7x - 14) + 3 = 12(8x + 20) + 1$
- b) $3(6x - 9) = 9(2x - 3)$
d) $5x - 4(2 - 3x) = 22 + 7x$
f) $8(3x - 5) = 60 + 20x$
- b) $6(1 - 3x) + 7(4x - 3) = 35$
d) $5(x + 1,2) - 4 = 10x + 3$
f) $8 - 10x - 2 = 8 - 5(x + 1,4)$
- b) $6t + 2 = 2(4t - 1) - 10$
d) $18 + 3(2x - 3) = 3$
f) $3(5 - 2x) - 7 = 25 - 5(1 + 2x)$
- b) $(x - 2) \cdot 5 = 25$
d) $(3x + 13) \cdot 3 = 156$
f) $(4x - 17) \cdot 3 + 5 = 14$
- b) $(3x + 5) \cdot 2 = (2x - 1) \cdot 4$
d) $9(3x - 11) = 4(5x - 9)$
f) $5(2x + 4) = 2(4x + 6)$
- b) $-3(x - 3) = 5 + 8(3 - x)$
d) $30(a - 2) - 5(4 - a) = 40(a - 7) + 194$
f) $13(4x + 2) - 9(6x - 1) = 18(10x + 7)$
- b) $5(x + 3) = 3(x + 4)$
d) $7(x + 8) + 2(x - 1) = 3(2x + 4)$
f) $5(5x - 12) = 4(2x - 8) - (3x + 4)$
- b) $3(4x + 2) + 2(x - 1) - 4(x + 3) = 0$
d) $2(2x - 4) + 3(3x - 3) - 4(x + 1) = 6$
f) $12x - 3 - 2(x + 5) - 3(x - 2) = 7$

- 12.** a) $6(16 - x) - 9(15 - 2x) = 18(x - 3) + 3$
 b) $15(x - 16) - 18(3 - x) = 12(x - 18) + 10(x - 3) - 4$
 c) $7x - 5(8x - 3) - 6(12 + 3x) = 6x$
 d) $25(8x - 3) - 25(3x - 8) = 5(16 + 20x) + 70$
 e) $80(100 - 3x) - 90(200 - 5x) = 10(x + 110) + 8900$
 f) $56(8 - x) - 2(7x + 2) = 9(65 - 50x) + 239$

- 13.** a) $18(5 - 2x) + 5(6x + 18) = 6(x - 4) + 9(12 - x)$
 b) $2(3x + 5) - (37 - 15x) + 13(9 - 2x) - 15(6 - x)$
 c) $2(3 - 1,4x) - 4(5 - 1,6x) + 6(7 - 1,8x) + 8 = 0$
 d) $4,3x - 12(0,3x + 1,2) = 0,3(20x - 9) - 2(4,6x - 2) - 0,1$
 e) $2(x - 0,1) + 3(2x - 0,01) + 4(3x - 0,001) = 19,766$
 f) $5(x - 7) - 15 = 36 - 7,5x - 4(3,5x - 5)$

- 14.** a) $4(2x - 3) - 8(3x - 2) + 4(x - 12) = 23 - 9(3x - 9) - 8(4x - 5)$
 b) $9x - 3 - 2(8x + 6) - 4(x + 8) - 3(2 + 8x) = 4(x - 6) + 10$
 c) $8 - 2x + (8x - 4) - (2x + 5) = -3[2x - 3(4x + 5) + (x + 3)] + 9$
 d) $9x + (2x + 3) - 2[2x - 4(3x + 5)] - 4[8x + 5 - 3(5x + 2)] = 8(3x + 1,5)$
 e) $6[3x - 2(x - 5) + (x + 3)] - 8\{2x - 2[4x - 3(x + 1)]\} = 9(x + 3)$
 f) $5(8x - 4) + 9[2x + 12(x + 1) - 3] = 5\{2x + 2[x + (3x - 4)2]\} - 31$

Demo

Aufgabensammlung

Gleichungen – Klammer mal Klammer / Bin. Formeln

1. a) $(20 + x)(20 - x) = (x + 2)(46 - x)$ | b) $(x + 5)(5 - x) = (12 + x)(4 - x) + 1$
 c) $(x - 5)(x + 8) = (x - 2)(x + 1) + 6$ | d) $(x + 12)(x + 5) = (x - 8)(x + 7) - 10$
 e) $(x - 8)(x - 15) = (x - 8)(x - 25)$ | f) $(x + 9)(x - 17) = (x - 5)(x - 10)$
2. a) $(x + 2)(x - 3) = x(x - 2)$ | b) $(2x + 4)(2x - 5) = (4x - 3)(x + 2)$
 c) $(2x - 4)(3 - x) = (x + 4)(2 - 2x)$ | d) $x(3x + 2) = (3x - 6)(x + 2)$
 e) $(x - 2)(x + 5) = (x + 6)(x - 1)$ | f) $(x - 2)(2x + 3) = (4 - x)(5 - 2x) + 1$
3. a) $(12 - x)(15 + x) = (8 - x)(9 + x)$ | b) $(15 - x)(20 + x) = (30 - x)(5 + x)$
 c) $(x + 20)(x - 30) = (x - 10)(x + 40)$ | d) $(9 + x)(15 + x) = (3 + x)(5 + x)$
 e) $(2x - 15)(3x + 4) = (6x - 4)(x + 12) - 117$
 f) $(x + 2)(3 - x) = (5 + x)(7 - x) + 2(x + 29)$
4. a) $(x - 5)(3x + 2) = 3(x - 2)(x - 4) + 1$
 b) $6x + (4x + 3)(x - 9) = (3x - 8)(x + 9) + x^2 - 1$
 c) $(3 - x)(5 + x) - 4x = (2 - x)(8 + x) - x$
 d) $(4x + 20)(2x - 8) + 12x = 5x^2 + (3x - 2)(x + 80)$
 e) $(6x - 15)(3x + 20) = (5x - 4)(8x + 3) - (12 + 22x^2)$
 f) $(4x - 14)(3x + 12) - 50 = (2x + 17)(6x - 1) - 13$
5. a) $(x + 2)(3x + 4) - (x - 2)(2x - 1) - (x + 4)(x + 3) = 26$
 b) $(9x - 4)(2x - 6) + (7x - 3)(x + 5) - (5x + 3)(5x - 1) = 4$
 c) $(6x + 4)(2x - 1) - (8x + 3)(2x + 5) + (4x + 3)(x - 1) = 5$
 d) $(9x + 8)(3x - 2) - (5x + 6)(6x - 2) = (5 - 3x)(8 + x)$
 e) $(4x - 3)(2x + 6) + (3x - 4)(2x + 6) = (7x + 4)(2x - 5)$
 f) $(2x + 1)(x - 4) - (3x + 6)(2x - 8) = (3x + 5)(2x - 6) - (5x + 2)(2x - 3)$
6. a) $(x - 3)(x + 17) + 12x = (x - 1)(x + 5) - 2$
 b) $(3x - 25) + (2x + 15)(3x - 20) = (6x + 30)(x + 20) - 167x$
 c) $-(15 - 12x) - (3x - 15)(5x + 22) = -12x(x - 45) - (3x^2 - 400) - 604$
 d) $(2x - 30)(x + 5) + (3x - 8)(2x + 15) = 2x(4x - 9)$
 e) $(9x + 12)(2x - 20) - 64x = (3x - 45)(6x - 50) - 90$
 f) $50x - (69 - 20x) + (12x + 5)(2x - 8) = 24x^2 - (2x + 12)(x - 4) + (2x^2 - 1)$
7. a) $(x + 3)^2 = (x - 1)^2$ | b) $(x + 6)^2 - (x - 5)^2 = 0$
 c) $(2x + 4)^2 = (2x - 8)^2$ | d) $(2x + 3)^2 - (x + 1)^2 - x(3x + 2) = 5$
 e) $(x - 1)^2 - (x - 4)^2 = (x + 3)^2 - (x + 2)^2$
 f) $(2x + 1)^2 - (4x - 3)^2 = (3 - 6x)(2x + 1) - (x - 18)$
8. a) $(x + 3)^2 - (x + 4)^2 = (3x + 2)^2 - (3x - 4)(3x + 4) + 1$
 b) $(4x + 3)^2 + (3x + 7)^2 - 1 = (5x + 3)(5x - 3)$
 c) $(7x + 2)^2 - (12x + 3)(4x + 1) = (x + 4)^2 - (3x + 12)$
 d) $(6x + 3)^2 + (5x + 2)(3x - 4) - (7x - 6)^2 = (x + 3)^2 + x(x + 2) + 5$
 e) $(2x - 4)^2 + (x - 3)^2 - x(5x + 4) = (5x + 6)^2 - (4x + 3)^2 - (3x + 2)(3x - 2) + 56$
 f) $(4x - 5)^2 - 2x(x + 3) - (3x + 5)(3x - 5) = (5x + 1)(x - 3) - 11$

Gleichungen mit Multiplikationsklammern und Binomischen Formeln

Aufgabe:

Löse die folgende Gleichung.

$$32(5 - x) - 64(3 - x) = 0$$

Lösung:

$$32(5 - x) - 64(3 - x) = 0 \quad | \text{Klammern auflösen}$$

$$160 - 32x - 192 + 64x = 0 \quad | \text{zusammenfassen}$$

$$32x - 32 = 0 \quad | \text{Gleichung lösen}$$

$$32x = 32$$

$$x = 1$$

$$L = \{1\}$$

Aufgabe:

Löse die folgende Gleichung.

$$(x + 5)(x - 3) - (x + 6)(x - 2) = 0$$

Lösung:

$$(x + 5)(x - 3) - (x + 6)(x - 2) = 0 \quad | \text{Klammer auflösen – achte auf das Minuszeichen!}$$

$$x^2 - 3x + 5x - 15 - (x^2 - 2x + 6x - 12) = 0 \quad | \text{Auflösen der Subtraktionsklammer}$$

$$x^2 - 3x + 5x - 15 - x^2 + 2x - 6x + 12 = 0 \quad | \text{Zusammenfassen}$$

$$-2x - 3 = 0 \quad | \text{Gleichung lösen}$$

$$x = -1,5$$

$$L = \{-1,5\}$$

Aufgabe:

Löse die folgende Gleichung

$$(x + 3)^2 + (x - 4)^2 = (x - 1)^2 + (x + 2)^2$$

Lösung:

$$(x + 3)^2 + (x - 4)^2 = (x - 1)^2 + (x + 2)^2 \quad | \text{Klammern mit Hilfe der Binomischen Formeln auflösen}$$

$$x^2 + 6x + 9 + x^2 - 8x + 16 = x^2 - 2x + 1 + x^2 + 4x + 4 \quad | \text{Zusammenfassen}$$

$$2x^2 - 2x + 25 = 2x^2 + 2x + 5 \quad | -2x^2$$

$$20 = 4x$$

$$5 = x$$

$$L = \{5\}$$

Merke:

1. Auf beiden Seiten der Gleichung werden die Klammern aufgelöst
2. Beide Seiten der Gleichung werden vereinfacht
3. Die Gleichung wird gelöst
4. Probe (fehlt im obigen Beispiel)
5. Angabe der Lösungsmenge

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Demo

Aufgabensammlung

Gleichungen mit Multiplikationsklammern und Binomischen Formeln

Das Auflösen von Klammern (Klammern mal Zahl, Klammer mal Klammer, Binomische Formeln) kennen wir bereits. Wir wollen jetzt Gleichungen lösen, in denen Multiplikationsklammern und Binomische Formeln vorkommen.

Beispiel 1:

$$\begin{aligned}32(5-x) - 64(3-x) &= 0 && | \text{Klammern auflösen} \\160 - 32x - 192 + 64x &= 0 && | \text{zusammenfassen} \\32x - 32 &= 0 && | \text{Gleichung lösen} \\32x &= 32 \\x &= 1 \\L &= \{1\}\end{aligned}$$

Beispiel 2:

$$\begin{aligned}(x+5)(x-3) - (x+6)(x-2) &= 0 && | \text{Klammer auflösen - achte} \\&&& \text{auf das Minuszeichen!} \\x^2 - 3x + 5x - 15 - (x^2 - 2x + 6x - 12) &= 0 && | \text{Auflösen der Subtraktionsklammer} \\x^2 - 3x + 5x + 15 - x^2 + 2x - 6x + 12 &= 0 && | \text{Zusammenfassen} \\-2x - 3 &= 0 && | \text{Gleichung lösen}\end{aligned}$$

Aufgabensammlung

Beispiel 3:

$$\begin{aligned}(x+3)^2 + (x-4)^2 &= (x-1)^2 + (x+2)^2 && | \text{Klammern mit Hilfe der} \\&&& \text{Binomischen Formeln auflösen} \\x^2 + 6x + 9 + x^2 - 8x + 16 &= x^2 - 2x + 1 + x^2 + 4x + 4 && | \text{Zusammenfassen} \\2x^2 - 2x + 25 &= 2x^2 + 2x + 5 && | -2x^2 \\20 &= 4x \\5 &= x \\L &= \{5\}\end{aligned}$$

Gleichungen Klammer mal Zahl – Lösungen

1. a) $7(x - 2) = 49$
 $L = \{ 9 \}$
c) $15(8x - 24) = 120$
 $L = \{ 4 \}$
e) $12(5x - 2) = 48 + 12x$
 $L = \{ 1,5 \}$
2. a) $23(2x + 5) = 6x + 315$
 $L = \{ 5 \}$
c) $16(2x - 3) = 5(4x + 16) + 4$
 $L = \{ 11 \}$
e) $13(20 - 5x) = 15(30 - 5x)$
 $L = \{ 19 \}$
3. a) $5(3x - 4) = 7(2x - 3)$
 $L = \{ -1 \}$
c) $8(3x - 5) = 60 + 20x$
 $L = \{ 25 \}$
e) $3(x + 6) + 2(x + 1) = 40$
 $L = \{ 4 \}$
4. a) $5x - 4(2 - 3x) = 22 + 7x$
 $L = \{ 3 \}$
c) $18q + 3 = 3(6,1q - 5)$
 $L = \{ 60 \}$
e) $4(x + 9) - 34 = 2(x - 4) + 11$
 $L = \{ 0,5 \}$
5. a) $13 + 2(3x - 2) = 3$
 $L = \{ -1 \}$
c) $3(5 - 2x) - 8 = 24 - 5(2x + 1)$
 $L = \{ 3 \}$
e) $6x + 5 = 2(4x - 1) - 7$
 $L = \{ 7 \}$
6. a) $(x + 3) \cdot 7 = 28$
 $L = \{ 1 \}$
c) $(2x - 8) \cdot 7 = 98$
 $L = \{ 11 \}$
e) $11 \cdot (2x - 19) = 121$
 $L = \{ 15 \}$
7. a) $(3x + 6) \cdot 2 = 3 \cdot (4x - 2)$
 $L = \{ 3 \}$
c) $11(x + 2) = 7(2x - 2)$
 $L = \{ 12 \}$
e) $(10 - 2x) \cdot 3 = (3x + 9) \cdot 2$
 $L = \{ 1 \}$
- b) $7(5x + 2) + 9 = 58$
 $L = \{ 1 \}$
d) $6(3x - 25) = 12$
 $L = \{ 9 \}$
f) $3(4x + 18) = 6x + 108$
 $L = \{ 9 \}$
- b) $17(5x + 3) = 401 + 35x$
 $L = \{ 7 \}$
d) $12(8x - 25) = 5(16x + 40) - 20$
 $L = \{ 30 \}$
f) $14(7x - 14) + 3 = 12(8x + 20) + 1$
 $L = \{ 217 \}$
- b) $3(6x - 9) = 9(2x - 3)$
 $L = G$
d) $5x - 4(2 - 3x) = 22 + 7x$
 $L = \{ 3 \}$
f) $8(3x - 5) = 60 + 20x$
 $L = \{ 25 \}$
- b) $6(1 - 3x) + 7(4x - 3) = 35$
 $L = \{ 5 \}$
d) $5(x + 1,2) - 4 = 10x + 3$
 $L = \{ -0,2 \}$
f) $8 - 10x - 2 = 8 - 5(x + 1,4)$
 $L = \{ 1 \}$
- b) $6t + 2 = 2(4t - 1) - 10$
 $L = \{ 7 \}$
d) $18 + 3(2x - 3) = 3$
 $L = \{ -1 \}$
f) $3(5 - 2x) - 7 = 25 - 5(1 + 2x)$
 $L = \{ 3 \}$
- b) $(x - 2) \cdot 5 = 25$
 $L = \{ 7 \}$
d) $(3x + 13) \cdot 3 = 156$
 $L = \{ 13 \}$
f) $(4x - 17) \cdot 3 + 5 = 14$
 $L = \{ 5 \}$
- b) $(3x + 5) \cdot 2 = (2x - 1) \cdot 4$
 $L = \{ 7 \}$
d) $9(3x - 11) = 4(5x - 9)$
 $L = \{ 9 \}$
f) $5(2x + 4) = 2(4x + 6)$
 $L = \{ -4 \}$

- 8.** a) $6(5 - x) - 3(x - 4) = 6$
 $L = \{ 4 \}$
 c) $10 - 3(5 - 4x) = 15x + 40$
 $L = \{ -15 \}$
 e) $9(4 - 6x) = -20 - (3 - 5x)$
 $L = \{ 1 \}$
- b) $-3(x - 3) = 5 + 8(3 - x)$
 $L = \{ 4 \}$
 d) $30(a - 2) - 5(4 - a) = 40(a - 7) + 194$
 $L = \{ 1, 2 \}$
 f) $13(4x + 2) - 9(6x - 1) = 18(10x + 7)$
 $L = \{ -0,5 \}$
- 9.** a) $3(x + 2) = 2(x + 1) - 5$
 $L = \{ -9 \}$
 c) $4(2x + 8) - 3(x + 4) = 5$
 $L = \{ -3 \}$
 e) $5(3x - 2) + 7(2x - 4) - 3(x + 1) = 11$
 $L = \{ 2 \}$
- b) $5(x + 3) = 3(x + 4)$
 $L = \{ -1,5 \}$
 d) $7(x + 8) + 2(x - 1) = 3(2x + 4)$
 $L = \{ -14 \}$
 f) $5(5x - 12) = 4(2x - 8) - (3x + 4)$
 $L = \{ 1, 2 \}$
- 10.** a) $7(5x - 3) - 4(2x + 8) = 1$
 $L = \{ 2 \}$
 c) $14(5x + 8) + 4(-2x + 3) = 3(2x + 4)$
 $L = \{ -2 \}$
 e) $3x - 4(2x - 2) + 6 = -2(x + 5)$
 $L = \{ 8 \}$
- b) $3(4x + 2) + 2(x - 1) - 4(x + 3) = 0$
 $L = \{ 0, 8 \}$
 d) $2(2x - 4) + 3(3x - 3) - 4(x + 1) = 6$
 $L = \{ 3 \}$
 f) $12x - 3 - 2(x + 5) - 3(x - 2) = 7$
 $L = \{ 2 \}$
- 11.** a) $5(3x - 7) - 3(6x + 8) = 6(12 - x) + 1$
 $L = \{ 44 \}$
 b) $14 + 12(2x - 8) = 5(18 + 4x)$
 $L = \{ 43 \}$
 c) $18 - 15(3x + 2) - 6(2x - 1) = 4(9 - 12x) + 3$
 $L = \{ -5 \}$
 d) $16 + 4(2x - 36) - 18x = 5(-4x + 22) + 2$
 $L = \{ 24 \}$
 e) $3(2x + 9) - 9(4 + x) = 3(5 + x) - 2(x + 6)$
 $L = \{ -3 \}$
 f) $4(x - 8) + 7(14 - x) = 5(x + 9) - 2(x + 10) - 1$
 $L = \{ 7 \}$
- 12.** a) $6(16 - x) - 9(15 - 2x) = 18(x - 3) + 3$
 $L = \{ 2 \}$
 b) $15(x - 16) - 18(3 - x) = 12(x - 18) + 10(x - 3) - 4$
 $L = \{ 4 \}$
 c) $7x - 5(8x - 3) - 6(12 + 3x) = 6x$
 $L = \{ -1 \}$
 d) $25(8x - 3) - 25(3x - 8) = 5(16 + 20x) + 70$
 $L = \{ 1 \}$
 e) $80(100 - 3x) - 90(200 - 5x) = 10(x + 110) + 8900$
 $L = \{ 100 \}$
 f) $56(8 - x) - 2(7x + 2) = 9(65 - 50x) + 239$
 $L = \{ 1 \}$

13. a) $18(5 - 2x) + 5(6x + 18) = 6(x - 4) + 9(12 - x)$

$L = \{ 32 \}$

b) $2(3x + 5) - (37 - 45x) + 13(9 - 2x) = 15(6 - x)$

$L = \{ 0 \}$

c) $2(3 - 1,4x) - 4(5 - 1,6x) + 6(7 - 1,8x) + 8 = 0$

$L = \{ 5 \}$

d) $4,3x - 12(0,3x + 1,2) = 0,3(20x - 9) - 2(4,6x - 2) - 0,1$

$L = \{ 4 \}$

e) $2(x - 0,1) + 3(2x - 0,01) + 4(3x - 0,001) = 19,766$

$L = \{ 1 \}$

f) $5(x - 7) - 15 = 36 - 7,5x - 4(3,5x - 5)$

$L = \{ 4 \}$

14. a) $4(2x - 3) - 8(3x - 2) + 4(x - 12) = 23 - 9(3x - 9) - 8(4x - 5)$

$L = \{ 4 \}$

b) $9x - 3 - 2(8x + 6) - 4(x + 8) - 3(2 + 8x) = 4(x - 6) + 10$

$L = \{ -1 \}$

c) $8 - 2x + (8x - 4) - (2x + 5) = -3[2x - 3(4x + 5) + (x + 3)] + 9$

$L = \{ -2 \}$

d) $9x + (2x + 3) - 2[2x - 4(3x + 5)] - 4[8x + 5 - 3(5x + 2)] = 8(3x + 1,5)$

$L = \{ -1 \}$

e) $6[3x - 2(x - 5) + (x + 3)] - 8\{2x - 2[4x - 3(x + 1)]\} = 9(x + 3)$

$L = \{ -1 \}$

f) $5(8x - 4) + 9[2x + 12(x + 1) - 3] = 5\{2x + 2[x + (3x - 4)2]\} - 31$

$L = \{ -2 \}$

Aufgabensammlung

Gleichungen – Klammer mal Klammer / Bin. Formeln – Lösungen

1. a) $(20 + x)(20 - x) = (x + 2)(46 - x)$
 $L = \{ 7 \}$
b) $(x + 5)(5 - x) = (12 + x)(4 - x) + 1$
 $L = \{ 3 \}$
c) $(x - 5)(x + 8) = (x - 2)(x + 1) + 6$
 $L = \{ 11 \}$
d) $(x + 12)(x + 5) = (x - 8)(x + 7) - 10$
 $L = \{ -7 \}$
e) $(x - 8)(x - 15) = (x - 8)(x - 25)$
 $L = \{ 8 \}$
f) $(x + 9)(x - 17) = (x - 5)(x - 10)$
 $L = \{ 29 \}$
2. a) $(x + 2)(x - 3) = x(x - 2)$
 $L = \{ 6 \}$
b) $(2x + 4)(2x - 5) = (4x - 3)(x + 2)$
 $L = \{ -2 \}$
c) $(2x - 4)(3 - x) = (x + 4)(2 - 2x)$
 $L = \{ 1, 25 \}$
d) $x(3x + 2) = (3x - 6)(x + 2)$
 $L = \{ -6 \}$
e) $(x - 2)(x + 5) = (x + 6)(x - 1)$
 $L = \{ -2 \}$
f) $(x - 2)(2x + 3) = (4 - x)(5 - 2x) + 1$
 $L = \{ 2, 25 \}$
3. a) $(12 - x)(15 + x) = (8 - x)(9 + x)$
 $L = \{ 54 \}$
b) $(15 - x)(20 + x) = (30 - x)(5 + x)$
 $L = \{ 5 \}$
c) $(x + 20)(x - 30) = (x - 10)(x + 40)$
 $L = \{ -5 \}$
d) $(9 + x)(15 + x) = (3 + x)(5 + x)$
 $L = \{ -7, 5 \}$
e) $(2x - 15)(3x + 4) = (6x - 4)(x + 12) - 117$
 $L = \{ 1 \}$
f) $(x + 2)(3 - x) = (5 + x)(7 - x) + 2(x + 29)$
 $L = \{ -29 \}$
4. a) $(x - 5)(3x + 2) = 3(x - 2)(x - 4) + 1$
 $L = \{ 7 \}$
b) $6x + (4x + 3)(x - 9) = (3x - 8)(x + 9) + x^2 - 1$
 $L = \{ 1 \}$
c) $(3 - x)(5 + x) - 4x = (2 - x)(8 + x) - 7$
 $L = \{ 1 \}$
d) $(4x + 20)(2x - 8) + 12x = 5x^2 + (3x - 2)(x + 80)$
 $L = \{ 0 \}$
e) $(6x - 15)(3x + 20) = (5x - 4)(8x + 3) - (12 + 22x^2)$
 $L = \{ 3 \}$
f) $(4x - 14)(3x + 12) - 50 = (2x + 17)(6x - 1) - 13$
 $L = \{ -2 \}$
5. a) $(x + 2)(3x + 4) - (x - 2)(2x - 1) - (x + 4)(x + 3) = 26$
 $L = \{ 4 \}$
b) $(9x - 4)(2x - 6) + (7x - 3)(x + 5) - (5x + 3)(5x - 1) = 4$
 $L = \{ 0, 2 \}$
c) $(6x + 4)(2x - 1) - (8x + 3)(2x + 5) + (4x + 3)(x - 1) = 5$
 $L = \{ -0, 6 \}$
d) $(9x + 8)(3x - 2) - (5x + 6)(6x - 2) = (5 - 3x)(8 + x)$
 $L = \{ -44 \}$
e) $(4x - 3)(2x + 6) + (3x - 4)(2x + 6) = (7x + 4)(2x - 5)$
 $L = \{ 0, 4 \}$
f) $(2x + 1)(x - 4) - (3x + 6)(2x - 8) = (3x + 5)(2x - 6) - (5x + 2)(2x - 3)$
 $L = \{ -34 \}$

6. a) $(x - 3)(x + 17) + 12x = (x - 1)(x + 5) - 2$
 $L = \{ 2 \}$
 b) $(3x - 25) + (2x + 15)(3x - 20) = (6x + 30)(x + 20) - 167x$
 $L = \{ 37 \}$
 c) $-(15 - 12x) - (3x - 15)(5x + 22) = -12x(x - 45) - (3x^2 - 400) - 604$
 $L = \{ 1 \}$
 d) $(2x - 30)(x + 5) + (3x - 8)(2x + 15) = 2x(4x - 9)$
 $L = \{ 10 \}$
 e) $(9x + 12)(2x - 20) - 64x = (3x - 45)(6x - 50) - 90$
 $L = \{ 12 \}$
 f) $50x - (69 - 20x) + (12x + 5)(2x - 8) = 24x^2 - (2x + 12)(x - 4) + (2x^2 - 1)$
 $L = \{ -13 \}$
7. a) $(x + 3)^2 = (x - 1)^2$
 $L = \{ -1 \}$
- | |
|--|
| b) $(x + 6)^2 - (x - 5)^2 = 0$
$L = \{ -0,5 \}$ |
|--|
-
- | | |
|---|--|
| c) $(2x + 4)^2 = (2x - 8)^2$
$L = \{ 1 \}$ | d) $(2x + 3)^2 - (x + 1)^2 - x(3x + 2) = 5$
$L = \left\{ -\frac{3}{8} \right\}$ |
|---|--|
- e) $(x - 1)^2 - (x - 4)^2 = (x + 3)^2 - (x + 2)^2$
 $L = \{ 5 \}$
 f) $(2x + 1)^2 - (4x - 3)^2 = (3 - 6x)(2x + 1) - (x - 18)$
 $L = \{ 1 \}$
8. a) $(x + 3)^2 - (x + 4)^2 = (3x + 2)^2 - (3x - 4)(3x + 4) + 1$
 $L = \{ -2 \}$
 b) $(4x + 3)^2 + (3x + 7)^2 - 1 = (5x + 3)(5x - 3)$
 $L = \{ -1 \}$
 c) $(7x + 2)^2 - (12x + 3)(4x + 1) = (x + 4)^2 - (3x + 12)$
 $L = \{ -3 \}$
 d) $(6x + 3)^2 + (5x + 2)(3x - 4) - (7x - 6)^2 = (x + 3)^2 + x(x + 2) + 5$
 $L = \{ 0,5 \}$
 e) $(2x - 4)^2 + (x - 3)^2 - x(5x + 4) = (5x + 6)^2 - (4x + 3)^2 - (3x + 2)(3x - 2) + 56$
 $L = \{ -1 \}$
 f) $(4x - 5)^2 - 2x(x + 3) - (3x + 5)(3x - 5) = (5x + 1)(x - 3) - 11$
 $L = \{ 2 \}$