Einfache Gleichungen 1

1. a) $x + 3 = 8$ b) $x + 2 = 12$ c) $x + 9 = 18$
d) $x + 4 = 5$ e) $x + 22 = 44$ f) $x + 28 = 30$
g) $x + 7 = 2$ h) $x + 8 = -4$ i) $x + 2 = -12$

2. a) $x - 1 = 2$ b) $x - 3 = 5$ c) $x - 4 = 11$
d) $x - 8 = 9$ e) $x - 2 = 13$ f) $x - 12 = 22$
g) $x - 7 = -11$ h) $x - 9 = -14$ i) $x - 1 = -19$

3. a) $x \cdot 5 = 15$ b) $x \cdot 2 = 8$ c) $x \cdot 7 = 21$
d) $3 \cdot x = 27$ e) $9 \cdot x = 45$ f) $8 \cdot x = 64$
g) $x \cdot 2 = 4{,}2$ h) $5 \cdot x = 12{,}5$ i) $9 \cdot x = 1{,}8$

4. a) $\frac{x}{2} = 2$ b) $\frac{x}{5} = 1$ c) $\frac{x}{8} = 9$
d) $\frac{x}{5} = 9$ e) $\frac{x}{7} = 7$ f) $\frac{x}{6} = 9$
g) $\frac{x}{10} = 0{,}3$ h) $\frac{x}{4} = 1{,}1$ i) $\frac{x}{8} = 0{,}8$

5. a) $x - 2 = 5$ b) $3 + x = 1$ c) $\frac{x}{12} = -4$
d) $3 \cdot x = 3{,}6$ e) $x \cdot (-4) = -3{,}6$ f) $\frac{x}{3} = -1{,}1$
g) $x + 1{,}8 = 2{,}2$ h) $x - 3{,}6 = 1{,}5$ i) $-3 \cdot x = -1{,}5$

6. a) $3 - x = 4$ b) $2 - x = 8$ c) $7 - x = 5$
d) $9 - x = -3$ e) $5 - x = -8$ f) $-3 - x = -1$
g) $-2 - x = 6$ h) $3 - x = 5$ i) $-4 - x = 12$

7. a) $3x + 4 = 16$ b) $2x + 3 = 13$ c) $4 + 5x = 19$
d) $4x - 1 = 15$ e) $9x - 8 = 19$ f) $10x - 15 = 45$
g) $5 - 2x = 15$ h) $3 - 6x = 21$ i) $9 - 5x = -36$

8. a) $\frac{x}{2} - 4 = 3$ b) $3 + \frac{x}{3} = 2$ c) $\frac{x}{5} - 3 = 4$
d) $\frac{x}{5} + 8 = 2$ e) $4 + \frac{x}{8} = 5$ f) $\frac{3x}{4} + 2 = 5$
g) $\frac{2x}{5} - 1 = 5$ h) $-4 + \frac{5x}{6} = 1$ i) $9 + \frac{2x}{9} = 11$

9. a) $\frac{12}{x} = 3$ b) $\frac{6}{x} = 3$ c) $\frac{15}{x} = 15$
d) $\frac{14}{x} = 7$ e) $\frac{16}{x} = 4$ f) $\frac{49}{x} = 7$

Gleichungen mit Additions- und Subtraktionsklammern

1. a) $2x + (3x + 4) = 19$ b) $12x + (3x + 4) + (2x + 3) = 41$
c) $12x – 4 + (3x + 1) = 27$ d) $8x – 3 + (x + 1) = 2x + 7 + (4x + 3)$
e) $4 – (3x – 2) + 5x = 4 – (x + 1)$ f) $(4x – 4) – 8 = –(3x – 2)$

2. a) $12x + (13x – 19) – (11x – 15) = 25 – (17 – 13x)$
b) $(3x + 7) – 6 = 12x – (x + 4) – (4x – 5)$
c) $(5x – 3) – (2x – 4) = – (x + 3) – (x + 5) + (x + 3)$
d) $12 – (5x + 8) – (8x – 12) = 14x – 25 – (3x – 8) + (7x + 2)$
e) $–(3x – 5) – (7x – 24) = 3 + (x + 1) – (2x – 7)$
f) $12x – (3x + 8) + (39 – 5x) = 14 + (25x – 8) – (41 – x)$

3. a) $12x – 3 – (23x – 48) + (x + 93) = 58x – (24x – 44) + 6$
b) $–(19x + 51) – (11x + 4) = –(39x + 45) + (8x – 7) – 24$
c) $24 – (14x – 8) – (3 + 12x) = 4 – (8x + 11)$
d) $3{,}7 – (8{,}1x + 5{,}4) – (2{,}6x + 8{,}3) = –3{,}1x + (8 – 1{,}6x)$
e) $(4{,}5x + 56) – (2{,}25x – 7) – (300 – 3x) = – (0{,}75x – 3)$
f) $3{,}5x – 6 – (4 – 2x) = (2{,}4x – 9{,}4) – (1{,}2x – 25{,}2)$

Gleichungen – Klammer mal Zahl

1. a) $7(x – 2) = 49$ b) $7(5x + 2) + 9 = 58$
c) $15(8x – 24) = 120$ d) $6(3x – 25) = 12$
e) $12(5x – 2) = 48 + 12x$ f) $3(4x + 18) = 6x + 108$

2. a) $23(2x + 5) = 6x + 315$ b) $17(5x + 3) = 401 + 35x$
c) $16(2x – 3) = 5(4x + 16) + 4$ d) $12(8x – 25) = 5(16x + 40) – 20$
e) $13(20 – 5x) = 15(30 – 5x)$ f) $14(7x – 14) + 3 = 12(8x + 20) + 1$

3. a) $5(3x – 4) = 7(2x – 3)$ b) $3(6x – 9) = 9(2x – 3)$
c) $8(3x – 5) = 60 + 20x$ d) $5x – 4(2 – 3x) = 22 + 7x$
e) $3(x + 6) + 2(x + 1) = 40$ f) $8(3x – 5) = 60 + 20x$

4. a) $5x – 4(2 – 3x) = 22 + 7x$ b) $6(1 – 3x) + 7(4x – 3) = 35$
c) $18q + 3 = 3(6{,}1q – 5)$ d) $5(x + 1{,}2) – 4 = 10x + 3$
e) $4(x + 9) – 34 = 2(x – 4) + 11$ f) $8 – 10x – 2 = 8 – 5(x + 1{,}4)$

Gleichungen – Klammer mal Klammer

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) $(x + 2)(3 – x) = (5 + x)(7 – x) + 2(x + 29)$

Gleichungen mit 1 Variablen – verm. Übungen 1

1. a) $7x – (2x – 9) + (3x + 8) – (5x + 6) = 5$
b) $(4x – 5) – 6 = 12x – (x + 4) – (3x + 7)$

2. a) $14x + (11x – 19) – (13x – 15) = 25 – (17 – 15x)$
b) $26x – (14 + 19x) + (25 + 21x) = 29 – (–23x + 18)$

3. a) $17 – (13 – 9x) + (16x – 9) = (15x – 22) – (7 – 4x)$
b) $12 – (16 – 15x) + (11 – 9x) = (25 – 19x) – (13 – 23x)$

4. a) $7x – [14 – (2x + 5)] = 18 – [3x + (15 – 4x)]$
b) $4x – [7 – (x + 15)] = 11 – [5x – (3x – 17)]$

5. a) $21x – [9 – (5x – 6) + 8x] = 15 – [(4x – 7) – (6x – 5)]$
b) $19 – [13x – (22 + 7x) + 11] = 24x – [(15 – 4x) + (5x – 16)]$

6. a) $12x – [14 – (9x – 11)] = 24x – [18 – (17x + 13)]$
b) $17 – [13x – (15 – 19x) – 21x] = 25 – [(11x – 23) – (18x – 7)]$

7. a) $5(3x – 4) = 7(2x – 3)$ b) $3(6x – 9) = 9(2x – 3)$
c) $8(4x – 3) = 4(5x – 6)$ d) $3(7x – 9) = 4(6x – 7)$

8. a) $8 – 7(3x + 2) = 9x – 6(5x + 1)$
b) $3x – 2(5x – 8) = 9 – 4(3x + 7)$

9. a) $5(3x – 8) + 3(7x + 6) = 6(8x + 3) – 4(2x + 5)$
b) $8(4x + 3) – 5(6x – 5) = 4(9x + 4) – 7(4x – 5)$

10. a) $5(8x + 5) – 4(3x + 4) – 2(11x – 17) = 25 – 3(5x – 7) + 6(3x – 2)$
b) $(2x – 3)7 – (x – 2)6 – (5x + 6)2 = 26 – (3x – 4)4 + (6x – 5)3$

11. a) $(x + 4)(3x – 7) = (x – 2)(3x + 8)$ b) $(x + 5)(x + 2) = (x + 6)(x – 1)$

12. a) $(x – 4)(6 – x) = (x – 3)(8 – x)$ b) $(x + 3)(2x + 5) = (x + 7)(2x – 1)$

13. a) $(x – 2)(x + 3) = (x + 4)(x – 5)$ b) $(x + 1)(4x – 25) = (2x – 5)(2x – 8)$

14. a) $(x + 5)(x – 3) = (x + 6)(x – 2)$ b) $(x – 7)(x – 4) = (x – 5)(x – 2)$

15. a) $(x – 4)(x – 3) = x^2 – 7x + 12$ b) $(2x – 5)(x + 1) = 2x^2 – 3x – 5$

16. a) $(5x – 6)(2x + 3) + (2x + 3)(3x – 2) = 2x(8x + 1)$
b) $(9x – 2)(2x – 5) + (3x + 4)(5x + 3) = 3x(11x – 3)$

17. a) $(3x – 4)(2x – 1) – (3x + 1)(x – 3) = (3x – 1)(x – 1)$
b) $(2x + 1)(3x – 1) – (2x + 11)(2x – 5) = (x – 6)(2x – 3)$

18. a) $(5x – 3)(2x – 3) – 2(4x – 1)(x – 3) = (2x – 3)(x + 5)$
b) $(3x + 1)(4x – 5) – 3(x – 3)(2x – 1) = (6x + 1)(x + 1)$

a) $(x + 3)^2 + (x – 4)^2 = (x – 1)^2 + (x + 2)^2$

19. a) $(x + 3)^2 + (x – 4)^2 = (x – 1)^2 + (x + 2)^2$
b) $(3x + 5)^2 + (2x – 3)^2 = (4x + 1)^2 – 3(x^2 – 1)$

20. a) $(x + 1)^2 – (x – 3)^2 = (x – 2)^2 – (x – 4)^2$
b) $(4x + 3)^2 – (5x – 2)^2 = 6(x + 9) – (3x – 7)^2$

21. a) $(x + 1)(x – 1) – (x – 3)^2 = (x + 4)^2 – (x – 2)(x + 2)$
b) $(x – 3)^2 – (x + 6)(x – 6) = (2x + 3)(2x – 3) – 4(x^2 – 15)$

22. a) $(2x + 1)^2 – (x – 4)^2 = (3x – 2)^2 – (2x + 1)(2x – 1) – 2(x^2 – 7x + 10)$
b) $(2x – 3)^2 + (3x + 5)^2 = (4x + 3)^2 – (3x – 2)(x + 6) – (2x – 7)$

Gleichungen mit 1 Variablen – verm. Übungen 2

1. $5x + 4 – 6x + 8 = 3x + 4 – 8x – 7 + 3x$

2. $18 – x – 15 + x + 2x = 18 – x + 19 + 3x – 1 – x$

3. $x – (x + 3) + x – 5 = 6 – (x – 4) + (x + 1)$

4. $25x + 14 – (3x – 8) = 9x – (6x + 3) – 4x + (2 + 22x)$

5. $5 – [x + 6 – (3 – x)] – 10x = 6x – [(3x + 2) – x] – 17x$

6. $4(x – 3) + 5(x + 6) = 3 – 5(x + 3) + 13x$

7. $5x – (6 – 3x) + 6(3x – 8) = 23x – 4(x – 5) + 6x$

8. $172x + 19(24x – 17) = 207x – 18(61 – 18x) + 96x$

9. $12(x + 13) – 14x + 5(x + 12) – 4(x + 3) = 0$

10. $9x – \{5x – [4x – (3x – 2) – 3] – 4\} = 5x – 6 + x$

11. $x + 15 + 5(2x – 10) = 4x – (5 + x) + 2$

12. $17(3x – 8) – [4x – (3 – x)] = 46x – 1 – 3(x + 2)$

13. $31x – 58 + 4x – 16 = 5x + 24 + 9x – 18 + 4$

14. $52(17x – 28) + 92(44 – 53x) = –51x + 20563 + 29(71x + 1)$

15. $3x + 6(5x + 8) – 6 – (3 + x) – 6(x – 1) – 23x = 0$

16. $2x + 3a – 5b + 4a – x = 4(a + b)$

17. $12x – a – (a – x) = 14x + (a + b) – 3x + b$

18. $a + a^2 – b^2 – x = x – a + a^2 – b^2$

19. $ax + b + 2ax – 12b = 5ax – 3b – 6ax$

20. $(3a – x)^2 = (5a – x)^2$

21. $(5 + x)^2(a – b) = (5 + x)^2(a + b) – 2bx^2$

Gleichungen mit 1 Variablen – verm. Übungen 3

Bestimme die Lösungsmenge zu folgenden Gleichungen.

1. a) $12x – 56 = 16$ b) $5x + 39 = –26$
c) $\frac{4}{5}x + 40 = 48$ d) $1\frac{3}{5}x + 4,2 = 7,4$
e) $7x – 4 + 2x = 52 – 5x$ f) $40 – 2x + 5x = 68 + x$
g) $22x + 4(9 – 3x) = 46$ h) $4(3x – 5) + 30 = 46$

2. a) $18x – 75 + 3x + 128 – 7x = 68 – 8x – 25 + 14x$
b) $113x + 73 – 5x – 16 = 23x + 85 – 33x + 45 + 62x + 151$
c) $6x – 2(x – 16) = 5 – 3(11 – x) + 60$
d) $4x – 5(x – 12) = 40 + 9(9 – x) – 11$
e) $\frac{3}{4}(16x + 24) + 6(3x – 4) = \frac{2}{3}(27x + 18) + 6x – 3$
f) $3x – 15 + 2x = 18 + 4x + 25$

3. a) $17x – 33 + 12x – 16 = 4x + 56 + 10x$
b) $–22x + 36 + 18x – 6 = 16x + 55 + 12x – 89$
c) $4x – 22 + 3x – 45 = 8 – 2x + 26 + 5x – 1$
d) $6x + 36 – 2x + 45 = 3x + 88 – 8x + 47$
e) $12x – 66 – 34 + 2x = 8x – 35 + 2x + 99$
f) $–12x + 25 + 6x – 38 = 66 + 2x – 22 + 3x – 12x$

4. a) $66x + 14 – 39 + 12x – 100 = –12x – 47 + 23x + 56$
b) $22x + 48 – 55x – 55x = 36 – 45 + 12x – 43$
c) $–22 + 14x – 33 + 10x – 77 + 25x = 88 – 14x + 65 – 5 + 35$
d) $–78 + 66x – 21x + 20 – 47 + 88x = 10x – 36 – 36x + 90$
e) $55x – 44x – 12x –12x + 96 = 12x + 99 – 178 – 66x – 30$
f) $–44 – 25x + 29 – 32x – 98x + 14x = –47x + 66 – 58x + 124 + 11$

5. a) $12x – 33 + 20x – 78x + 36 – 48 + 30x – 45x + 558 – 14x – 605 – 58 = 0$
b) $–33x – 44x + 54 – 88 + 12x – 100 + 222x = 12 – 45x + 999 – 10x + 305 + 34$
c) $36x – 78 + 61x – 69 – 78 + 22x – 47x = 369 – 44x + 45 – 12x + 78 + 120x + 11$
d) $–987x – 564 + 55x – 123 + 78 = –987x + 258 – 25x + 478 + 255$
e) $16x^2 – 56x + 22 – 851 – 951 + 357x = 16x^2 + 698 – 14x + 548 – 20x – 11$
f) $–65a + 58 – 36a + 587 – 33a = 698 + 14a – 587a + 698 – 32a + 191$

6. a) $–789v + 258 – 11v + 456 – 894 = 336v + 201 – 45v + 710$
b) $66z + 587 – 65z + 32z – 784 = –35z + 368 – 45z + 125 – 12$
c) $– 47y + 569 – 45y – 55y + 231 = –147y + 987 – 36y + 444 + 89$
d) $665m – 478 – 365m + 884 – 320m = 6987 – 358 – 12m – 3365 + 6$
e) $–254a + 369 – 258 + 458a – 369 = –540a + 3320 + 142$
f) $–258x + 5873 – 3369 + 368x – 897 – 321x + 33 = 1007$