

**1** a) (1)  $2x + y = 5$   
 (2)  $3x - y = 5$   

$$\begin{array}{r} (1) + (2) \quad 5x = 10 \\ \hline x = 2 \end{array} \quad | :5$$
  
 $x = 2$  in (1) einsetzen:  
 $2 \cdot 2 + y = 5$   
 $4 + y = 5 \quad | -4$   
 $y = 1$   
 Lösung: (2; 1)

b) (1)  $x + 3y = 9$   
 (2)  $-x + y = 3$   

$$\begin{array}{r} (1) + (2) \quad 4y = 12 \\ \hline y = 3 \end{array} \quad | :4$$
  
 $y = 3$  in (1) einsetzen:  
 $x + 3 \cdot 3 = 9$   
 $x + 9 = 9 \quad | -9$   
 $x = 0$   
 Lösung: (0; 3)

c) (1)  $4x = y + 7$   
 (2)  $2x = -y + 11$   

$$\begin{array}{r} (1) + (2) \quad 6x = 18 \\ \hline x = 3 \end{array} \quad | :6$$
  
 $x = 3$  in (1) einsetzen:  
 $4 \cdot 3 = y + 7$   
 $12 = y + 7 \quad | -7$   
 $5 = y$   
 Lösung: (3; 5)

d) (1)  $13 + x = 6y$   
 (2)  $11 - x = 2y$   

$$\begin{array}{r} (1) + (2) \quad 24 = 8y \\ \hline 3 = y \end{array} \quad | :8$$
  
 $y = 3$  in (1) einsetzen:  
 $13 + x = 6 \cdot 3$   
 $13 + x = 18 \quad | -13$   
 $x = 5$   
 Lösung: (5; 3)

**2** In den Lösungen sind die Gleichungen bereits geordnet dargestellt.

a) (1)  $5x + 2y = 9$   
 (2')  $7x - 2y = 3$   

$$\begin{array}{r} (1) + (2') \quad 12x = 12 \\ \hline x = 1 \end{array} \quad | :12$$
  
 $x = 1$  in (1) einsetzen:  
 $5 + 2y = 9 \quad | -5$   
 $2y = 4 \quad | :2$   
 $y = 2$   
 Lösung: (1; 2)

b) (1)  $6x - 6y = 6$   
 (2')  $6x + 6y = 18$   

$$\begin{array}{r} (1) + (2') \quad 12x = 24 \\ \hline x = 2 \end{array} \quad | :12$$
  
 $x = 2$  in (1) einsetzen:  
 $6 \cdot 2 - 6y = 6$   
 $12 - 6y = 6 \quad | +6y - 6$   
 $6 = 6y \quad | :6$   
 $1 = y$   
 Lösung: (2; 1)

c) (1)  $3x - 7y = 5$   
 (2')  $-x + 7y = 3$   

$$\begin{array}{r} (1) + (2') \quad 2x = 8 \\ \hline x = 4 \end{array} \quad | :2$$
  
 $x = 4$  in (2') einsetzen:  
 $-4 + 7y = 3 \quad | +4$   
 $7y = 7 \quad | :7$   
 $y = 1$   
 Lösung: (4; 1)

d) (1)  $11x - 2y = -2$   
 (2)  $-6x + 2y = 12$   

$$\begin{array}{r} (1') + (2) \quad 5x = 10 \\ \hline x = 2 \end{array} \quad | :5$$
  
 $x = 2$  in (2) einsetzen:  
 $-6 \cdot 2 + 2y = 12$   
 $-12 + 2y = 12 \quad | +12$   
 $2y = 24 \quad | :2$   
 $y = 12$   
 Lösung: (2; 12)

**Seite 111**

**3** a) (1)  $2x + 4y = 40$   
 (2)  $3x - 2y = 4$   

$$\begin{array}{r} (1) \quad 2x + 4y = 40 \\ (2') \quad 6x - 4y = 8 \\ \hline (1) + (2') \quad 8x = 48 \\ \hline x = 6 \end{array} \quad | :8$$
  
 $x = 6$  in (1) einsetzen:  
 $2 \cdot 6 + 4y = 40$   
 $12 + 4y = 40 \quad | -12$   
 $4y = 28 \quad | :4$   
 $y = 7$   
 Lösung: (6; 7)

b) (1)  $2x + 3y = 19$   
 (2)  $x - y = 2$   

$$\begin{array}{r} (1) \quad 2x + 3y = 19 \\ (2) \quad x - y = 2 \\ \hline \end{array} \quad | \cdot 3$$

$$\begin{array}{r} (1) \quad 2x + 3y = 19 \\ (2) \quad 3x - 3y = 6 \\ \hline (1) + (2) \quad 5x = 25 \quad | :5 \\ x = 5 \end{array}$$

$x = 5$  in (2) einsetzen:

$$\begin{array}{r} 5 - y = 2 \quad | -5 \\ -y = -3 \quad | :(-1) \\ y = 3 \end{array}$$

Lösung: (5; 3)

$$\begin{array}{r} c) (1) \quad 3x - 4y = 13 \quad | \cdot 2 \\ (2) \quad -2x + 3y = -8 \quad | \cdot 3 \\ \hline (1') \quad 6x - 8y = 26 \\ (2') \quad -6x + 9y = -24 \\ \hline (1') + (2') \quad y = 2 \end{array}$$

$y = 2$  in (1) einsetzen:

$$\begin{array}{r} 3x - 4 \cdot 2 = 13 \\ 3x - 8 = 13 \quad | +8 \\ 3x = 21 \quad | :3 \\ x = 7 \end{array}$$

Lösung: (7; 2)

$$\begin{array}{r} d) (1) \quad 5x + 7y = 55 \quad | \cdot 3 \\ (2) \quad 3x - 2y = 2 \quad | \cdot (-5) \\ \hline (1') \quad 15x + 21y = 165 \\ (2') \quad -15x + 10y = -10 \\ \hline (1') + (2') \quad 31y = 155 \quad | :31 \\ y = 5 \end{array}$$

$y = 5$  in (2) einsetzen:

$$\begin{array}{r} 3x - 2 \cdot 5 = 2 \\ 3x - 10 = 2 \quad | +10 \\ 3x = 12 \quad | :3 \\ x = 4 \end{array}$$

Lösung: (4; 5)

$$\begin{array}{r} 6 \quad a) (1) \quad 4x + 2y = 14 \\ (2) \quad 2x - y = 1 \quad | \cdot 2 \\ \hline (1) \quad 4x + 2y = 14 \\ (2) \quad 4x - 2y = 2 \\ \hline (1) + (2) \quad 8x = 16 \quad | :8 \\ x = 2 \end{array}$$

$x = 2$  in (2) einsetzen:

$$\begin{array}{r} 2 \cdot 2 - y = 1 \quad | +y - 1 \\ 3 = y \end{array}$$

Lösung: (2; 3)

$$\begin{array}{r} b) (1) \quad 4x + 6y = 34 \\ (2) \quad 2x - 2y = 2 \quad | \cdot 3 \\ \hline (1) \quad 4x + 6y = 34 \\ (2') \quad 6x - 6y = 6 \\ \hline (1) + (2') \quad 10x = 40 \quad | :10 \\ x = 4 \end{array}$$

$x = 4$  in (2) einsetzen:

$$\begin{array}{r} 2 \cdot 4 - 2y = 2 \quad | +2y - 2 \\ 6 = 2y \quad | :2 \\ 3 = y \end{array}$$

Lösung: (4; 3)

$$\begin{array}{r} c) (1) \quad 2x + y = 3 \quad | \cdot 2 \\ (2) \quad -8x - 2y = 6 \\ \hline (1') \quad 4x + 2y = 6 \\ (2) \quad -8x - 2y = 6 \\ \hline (1') + (2) \quad -4x = 12 \quad | :(-4) \\ x = -3 \end{array}$$

$x = -3$  in (1) einsetzen:

$$\begin{array}{r} 2 \cdot (-3) + y = 3 \\ -6 + y = 3 \quad | +6 \\ y = 9 \end{array}$$

Lösung: (-3; 9)

$$\begin{array}{r} d) (1) \quad -3y + 2x = 3 \\ (2) \quad y + x = 14 \quad | \cdot 3 \\ \hline (1) \quad -3y + 2x = 3 \\ (2') \quad 3y + 3x = 42 \\ \hline (1) + (2') \quad 5x = 45 \quad | :5 \\ x = 9 \end{array}$$

$x = 9$  in (2) einsetzen:

$$\begin{array}{r} y + 9 = 14 \quad | -9 \\ y = 5 \end{array}$$

Lösung: (9; 5)

Seite 111, rechts

4 In den Lösungen sind die Gleichungen bereits geordnet dargestellt.

$$\begin{array}{r} \text{a) (1')} \quad 3,5x - 7y = 7 \\ \quad \quad (2') \quad 3,5x + 7y = 35 \\ \hline (1') + (2') \quad 7x = 42 \quad | :7 \\ \quad \quad \quad \quad \quad x = 6 \end{array}$$

$$\begin{array}{r} x = 6 \text{ in (2) einsetzen:} \\ 7y + 3,5 \cdot 6 = 35 \\ 7y + 21 = 35 \quad | -21 \\ 7y = 14 \quad | :7 \\ y = 2 \end{array}$$

Lösung: (6; 2)

$$\begin{array}{r} \text{b) (1)} \quad 2x + 3y = 10 \\ \quad \quad (2') \quad -2x - y = -6 \\ \hline (1) + (2') \quad 2y = 4 \quad | :2 \\ \quad \quad \quad \quad \quad y = 2 \end{array}$$

$$\begin{array}{r} y = 2 \text{ in (2) einsetzen:} \\ -2x = 2 - 6 \\ -2x = -4 \quad | :(-2) \\ x = 2 \end{array}$$

Lösung: (2; 2)

$$\begin{array}{r} \text{c) (1)} \quad x - 6,5y = 53 \\ \quad \quad (2') \quad -x - 7y = -26 \\ \hline (1) + (2') \quad -13,5y = 27 \quad | :(-13,5) \\ \quad \quad \quad \quad \quad y = -2 \end{array}$$

$$\begin{array}{r} y = -2 \text{ in (2) einsetzen:} \\ 26 - 7 \cdot (-2) = x \end{array}$$

$$\begin{array}{r} 40 = x \\ \text{Lösung: (40; -2)} \\ \text{d) (1')} \quad -4y + 6x = -24 \\ \quad \quad (2) \quad 4y - 9x = -12 \\ \hline (1') + (2) \quad -3x = -36 \quad | :(-3) \\ \quad \quad \quad \quad \quad x = 12 \end{array}$$

$$\begin{array}{r} x = 12 \text{ in (1) einsetzen:} \\ 6 \cdot 12 + 24 = 4y \\ 96 = 4y \quad | :4 \\ 24 = y \\ \text{Lösung: (12; 24)} \end{array}$$

$$\begin{array}{r} \text{5 a) (1)} \quad 7x - 6y = 9 \\ \quad \quad (2) \quad x + 3y = 9 \quad | \cdot 2 \\ \hline (1) \quad 7x - 6y = 9 \\ \quad \quad (2') \quad 2x + 6y = 18 \\ \hline (1) + (2') \quad 9x = 27 \quad | :9 \\ \quad \quad \quad \quad \quad x = 3 \end{array}$$

$$\begin{array}{r} x = 3 \text{ in (2) einsetzen:} \\ 3 + 3y = 9 \quad | -3 \\ 3y = 6 \quad | :3 \\ y = 2 \end{array}$$

Lösung: (3; 2)

$$\begin{array}{r} \text{b) (1)} \quad 4x + 3y = 8 \\ \quad \quad (2) \quad -2x - y = -6 \quad | \cdot 3 \\ \hline (1) \quad 4x + 3y = 8 \\ \quad \quad (2') \quad -6x - 3y = -18 \\ \hline (1) + (2') \quad -2x = -10 \quad | :(-2) \\ \quad \quad \quad \quad \quad x = 5 \end{array}$$

$$\begin{array}{r} x = 5 \text{ in (2) einsetzen:} \\ -2 \cdot 5 - y = -6 \quad | +y + 6 \\ -4 = y \end{array}$$

Lösung: (5; -4)

$$\begin{array}{r} \text{c) (1)} \quad 8x + 6y = 4 \\ \quad \quad (2) \quad -3y + 2,5x = 11 \quad | \cdot 2 \\ \hline (1) \quad 8x + 6y = 4 \\ \quad \quad (2') \quad 5x - 6y = 22 \\ \hline (1) + (2') \quad 13x = 26 \quad | :2 \\ \quad \quad \quad \quad \quad x = 2 \end{array}$$

$$\begin{array}{r} x = 2 \text{ in (1) einsetzen:} \\ 8 \cdot 2 + 6y = 4 \quad | -16 \\ 6y = -12 \quad | :6 \\ y = -2 \end{array}$$

Lösung: (2; -2)

$$\begin{array}{r} \text{d) (1)} \quad 6y = 6x - 3 \quad | :3 \\ \quad \quad (2) \quad 2x - 3y = 2 \\ \hline (1) \quad 2y = 2x - 1 \quad | -2x \\ (2) \quad 2x - 3y = 2 \\ \hline (1'') \quad -2x + 2y = -1 \\ (2) \quad 2x - 3y = 2 \\ \hline (1'') + (2) \quad -y = 1 \quad | :(-1) \\ \quad \quad \quad \quad \quad y = -1 \end{array}$$

$$\begin{array}{r} y = -1 \text{ in (2) einsetzen:} \\ 2x - 3 \cdot (-1) = 2 \\ 2x + 3 = 2 \quad | -3 \\ 2x = -1 \quad | :2 \\ x = -0,5 \end{array}$$

Lösung: (-0,5; -1)

$$\begin{array}{r}
 6 \text{ a) (1) } 5x + 2y = 16 \quad | \cdot 3 \\
 \quad (2) 8x - 3y = 7 \quad | \cdot 2 \\
 \hline
 \quad (1') 15x + 6y = 48 \\
 \quad (2') 16x - 6y = 14 \\
 \hline
 (1') + (2') \quad 31x = 62 \quad | :31 \\
 \quad \quad \quad x = 2
 \end{array}$$

Einsetzen von  $x = 2$  in (1) ergibt:  $y = 3$

Lösung: (2; 3)

$$\begin{array}{r}
 \text{b) (1) } 5x + 4y = 29 \quad | \cdot 2 \\
 \quad (2) -2x + 15y = 5 \quad | \cdot 5 \\
 \hline
 \quad (1') 10x + 8y = 58 \\
 \quad (2') -10x + 75y = 25 \\
 \hline
 (1') + (2') \quad 83y = 83 \quad | :83 \\
 \quad \quad \quad y = 1
 \end{array}$$

Einsetzen von  $y = 1$  in (1) ergibt:  $x = 5$

Lösung: (5; 1)

$$\begin{array}{r}
 \text{c) (1) } 3x - 2y = -22 \quad | \cdot 3 \\
 \quad (2) 7x + 6y = 2 \\
 \hline
 \quad (1') 9x - 6y = -66 \\
 \quad (2) 7x + 6y = 2 \\
 \hline
 (1') + (2') \quad 16x = -64 \quad | :16 \\
 \quad \quad \quad x = -4
 \end{array}$$

Einsetzen von  $x = -4$  in (1) ergibt:  $y = 5$

Lösung: (-4; 5)

$$\begin{array}{r}
 \text{d) (1) } 2x - 4y = 22 \quad | \cdot 3 \\
 \quad (2) 11x + 3y = 21 \quad | \cdot 4 \\
 \hline
 \quad (1') 6x - 12y = 66 \\
 \quad (2') 44x + 12y = 84 \\
 \hline
 (1') + (2') \quad 50x = 150 \quad | :50 \\
 \quad \quad \quad x = 3
 \end{array}$$

Einsetzen von  $x = 3$  in (1) ergibt:  $y = -4$

Lösung: (3; -4)