

Lösungen

LB. S. 92 Nr. 5

a) $-2x + 10 < 7$ ($x \in \mathbb{N}$)

$-2x + 10 < 7$

$-2x \leq -3$

$x > 1,5$

$\begin{array}{l} | -10 \\ | : (-2) ! \end{array}$

$L = \{x \geq 2; x \in \mathbb{N}\}$



b) $-3x + x + 4 \geq 3 + x$ ($x \in \mathbb{Z}$)

$-3x + x + 4 \geq 3 + x$

$-2x + 4 \geq 3 + x$

$-3x + 4 \geq 3$

$-3x \geq -1$

$x \leq 1/3$

$\begin{array}{l} | -x \\ | -4 \\ | : (-3) ! \end{array}$

$L = \{x \leq 0; x \in \mathbb{Z}\}$



c) $4(7 - 2x) - 14 \leq 30$ ($x \in \mathbb{Q}$)

$4(7 - 2x) - 14 \leq 30$

$28 - 8x - 14 \leq 30$

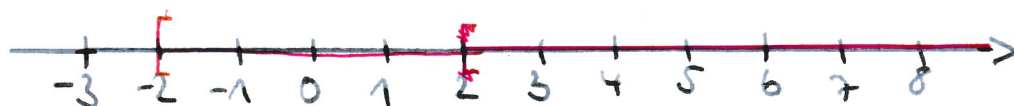
$+14 - 8x \leq 30$

$-8x \leq 16$

$x \geq -2$

$\begin{array}{l} | -14 \\ | : (-8) ! \end{array}$

$L = \{x \geq -2; x \in \mathbb{Q}\}$



$$\begin{aligned} \text{a)} \quad x^2 &> 20 & x = -5 \\ (-5)^2 &> 20 \\ \underline{\underline{25 > 20 \quad \text{w.A.}}} \end{aligned}$$

$$\begin{aligned} \text{b)} \quad -x &> 0 & x = -5 \\ -(-5) &> 0 \\ \underline{\underline{5 > 0 \quad \text{w.A.}}} \end{aligned}$$

$$\begin{aligned} \text{c)} \quad 1 &< \sqrt{x^2} & x = -5 \\ 1 &< \sqrt{(-5)^2} \\ 1 &< \sqrt{25} \\ \underline{\underline{1 < 5 \quad \text{w.A.}}} \end{aligned}$$

$$\begin{aligned} \text{d)} \quad |x+3| &> 0 & x = -5 \\ |-5+3| &> 0 \\ |-2| &> 0 \\ \underline{\underline{2 > 0 \quad \text{w.A.}}} \end{aligned}$$

$$\begin{aligned} \text{e)} \quad x+3 &> 0 & x = -5 \\ -5+3 &> 0 \\ \underline{\underline{-2 > 0 \quad \text{f.A.}}} \end{aligned}$$

$$\begin{aligned} \text{f)} \quad 25 &> x^2 & x = -5 \\ 25 &> (-5)^2 \\ \underline{\underline{25 > 25 \quad \text{f.A.}}} \end{aligned}$$

$$\begin{aligned} \text{g)} \quad 3(x+5) &\geq 0 & x = -5 \\ 3(-5+5) &\geq 0 \\ 3(0) &\geq 0 \\ \underline{\underline{0 \geq 0 \quad \text{w.A.}}} \end{aligned}$$

$$h) \quad 2 \cdot |x| < 5$$

$$x = -5$$

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$$2 \cdot |-5| < 5$$

$$2 \cdot 5 < 5$$

$$\underline{\underline{10 < 5 \quad \text{f.A.}}}$$

LB. S. 92 Nr. 9

$$a) \quad \begin{array}{r} x - 11 < 17 \\ \underline{\underline{x < 28}} \end{array}$$

$$| +11$$

$$b) \quad \begin{array}{r} 0,5x \leq 2,5 \\ \underline{\underline{x \leq 5}} \end{array}$$

$$| : 0,5$$

$$c) \quad \begin{array}{r} -x + 1 < 3 \\ -x < 2 \\ \underline{\underline{x > -2}} \end{array}$$

$$\begin{array}{l} | -1 \\ | : (-1) ! \end{array}$$

$$d) \quad \begin{array}{r} -18x > 162 \\ \underline{\underline{x < -9}} \end{array}$$

$$| : (-18) !$$

$$e) \quad \begin{array}{r} 14x - 2 > 24x \\ -10x - 2 > 0 \\ -10x > 2 \\ \underline{\underline{x < -0,2}} \end{array}$$

$$\begin{array}{l} | -24x \\ | +2 \\ | : (-10) ! \end{array}$$

$$f) \quad \begin{array}{r} -34x + 45 < -33 \\ -26x + 45 < -33 \\ -26x < -78 \\ \underline{\underline{x > 3}} \end{array}$$

$$\begin{array}{l} | -45 \\ | : (-26) ! \end{array}$$

$$g) \quad \begin{array}{l} x + 110 \geq x \\ \underline{\underline{\Rightarrow L = \{x \in \mathbb{Q}\}}} \end{array}$$

Jeder Wert + 110 ist größer als der Wert selbst.

$$h) \quad \begin{array}{l} x > x \\ \underline{\underline{\Rightarrow L = \{\emptyset\}}} \end{array}$$

Kein Wert ist größer als der Wert selbst.

LB. S. 93 Nr. 11

a)
$$\begin{array}{l} 2x < 8 \\ \underline{\underline{x < 4}} \end{array} \quad | :2$$

b)
$$\begin{array}{l} 5x > -3 \\ \underline{\underline{x > -\frac{3}{5}}} \end{array} \quad | :5$$

c)
$$\begin{array}{l} x^2 < 2 \\ x^2 < 2 \\ \underline{\underline{x < \sqrt{2}}} \\ \underline{\underline{L = \{ \dots \}}} \end{array} \quad (x \in \mathbb{Z}) \quad | \sqrt{\quad}$$

d)
$$\begin{array}{l} |x| + 3 < 5 \\ |x| < 2 \\ \left[\begin{array}{l} -|x| < -2 \\ |x| < 2 \end{array} \right] \\ \underline{\underline{L = \{ -1; 0; 1 \}}} \end{array} \quad | -3$$

e)
$$\begin{array}{l} x - 6 < 3x - 0,5 \\ -2x - 6 < -0,5 \\ -2x < 5,5 \\ \underline{\underline{x > -2,75}} \end{array} \quad \begin{array}{l} | -3x \\ | +6 \\ | :(-2) ! \end{array}$$

LB. S. 93 Nr. 15

Flächeninhalt Quadrat: $A = a^2$

geg:
$$\begin{array}{l} a^2 > 36 \text{ cm}^2 \\ \underline{\underline{a > 6 \text{ cm}}} \end{array} \quad | \sqrt{\quad}$$

Antwort: Das Quadrat muss eine Seitenlänge haben, die größer ist als 6cm.

- a) $x \leq -x$ $L = \{x \leq 0; x \in \mathbb{Q}\}$
(Null und alle negativen Zahlen)
- b) $y < y$ $L = \{\emptyset\}$
- c) $x + 1 > x$ $L = \{\infty\}$ $x \in \mathbb{Q}$
- d) $x - 1 > x$ $L = \{\emptyset\}$
- e) $3x > 5x$ $L = \{x < 0; x \in \mathbb{Q}\}$
(alle negativen Zahlen)
- f) $2x < 2x + 2$ $L = \{\infty\}$ $x \in \mathbb{Q}$