3. Bez   Bruchgleichungen   Lösungen AB 2

1.

$$\frac{2(6x-7)}{5} \geq 4 - x \qquad / \cdot 5$$
$$12x - 14 \geq 20 - 5x \qquad / +5x$$
$$17x - 14 \geq 20 \qquad / +14$$
$$17x \geq 34 \qquad / :17$$
$$x \geq 2 \qquad / :17$$
$$\underline{L \;=\; \{2; 3; 4 \dots\}}$$

2.

$$\frac{5x-13}{4} > 8 \qquad / \cdot 4$$
$$5x - 13 > 32 \qquad / +13$$
$$5x > 45 \qquad / :5$$
$$x > 9$$
$$\underline{L \;=\; \{10; 11; 12 \dots\}}$$

3.

$$2x - 3 < x \quad < \quad 3x + 3$$

$2x - 3 < x$	$/-x$	$x < 3x + 3$	$/-x$
$x - 3 < 0$	$/+3$	$0 < 2x + 3$	$/-3$
$\underline{x < 3}$		$-3 < 2x$	$/:2$
		$\underline{-1{,}5 < x}$	

$$\underline{L \;=\; \{-1; 0; 1; 2\}}$$

4. $\quad 2x - 3 \quad < \quad x \quad < \quad \frac{3x}{4} + 3$

$2x - 3 < x$	$/-x$	$x < \frac{3x}{4} + 3$	$/ \cdot 4$
$x - 3 < 0$	$/+3$	$4x < 3x + 12$	$/-3x$
$\underline{x < 3}$		$\underline{x < 12}$	

$$\underline{L \;=\; \{2; 1; 0; -1 \dots\}}$$

5.

$$\frac{x+5}{2} > 4 - x \qquad /\cdot 2$$

$$x + 5 > 8 - 2x \qquad /+2x$$

$$3x + 5 > 8 \qquad /-5$$

$$3x > 3 \qquad /:3$$

$$x > 1$$

$$\underline{L \quad = \quad \{2; 3; 4 \dots\}}$$

6.

$$\frac{6x-1}{11} < \frac{4x+3}{2} \qquad /\cdot 22$$

$$2(6x - 1) < 11(4x + 3)$$

$$12x - 2 < 44x + 33 \qquad /-12x$$

$$-2 < 32x + 33 \qquad /-33$$

$$-35 < 32x \qquad /:32$$

$$-\frac{35}{32} < x$$

$$\underline{L \quad = \quad \{-1; 0; 1; 2 \dots\}}$$

7.

$$\frac{4x-3}{2} - 2 < \frac{9x-5}{5} + 4 \qquad /\cdot 10$$

$$5(4x - 3) - 20 < 2(9x - 5) + 40$$

$$20x - 15 - 20 < 18x - 10 + 40$$

$$20x - 35 < 18x + 30 \qquad /-18x$$

$$2x - 35 < 30 \qquad /+35$$

$$2x < 65 \qquad /:2$$

$$x < 32{,}5$$

$$\underline{L \quad = \quad \{32; 31; 30 \dots\}}$$

8.

$$\frac{3(2x-7)}{8} - 1 < \frac{7x+1}{5} - 4 \qquad /\cdot 40$$

$$15(2x - 7) - 40 < 8(7x + 1) - 160$$

$$30x - 105 - 40 < 56x + 8 - 160$$

$$30x - 145 < 56x - 152 \qquad /-30x$$

$$-145 < 26x - 152 \qquad /+152$$

$$7 < 26x \qquad /:26$$

$$\frac{7}{26} < x$$

$$\underline{L \quad = \quad \{1; 2; 3 \dots\}}$$

9. $$\frac{4x}{3} - \frac{2}{3} < x \quad < \quad 2x + 1$$

$$\frac{4x}{3} - \frac{2}{3} < x \qquad /\cdot 3 \qquad\qquad x < 2x + 1 \qquad /-x$$

$$4x - 2 < 3x \qquad /-3x \qquad\qquad 0 < x + 1 \qquad /-1$$

$$x - 2 < 0 \qquad /+2 \qquad\qquad \underline{-1 < x}$$

$$\underline{x < 2}$$

$$\underline{L = \{0; 1\}}$$

10. $$\frac{x}{2} - 4 < 5 - \frac{x}{4} < \frac{x}{3}$$

$$\frac{x}{2} - 4 < 5 - \frac{x}{4} \qquad /\cdot 4 \qquad\qquad 5 - \frac{x}{4} < \frac{x}{3} \qquad /\cdot 12$$

$$2x - 16 < 20 - x \qquad /+x \qquad\qquad 60 - 3x < 4x \qquad /+3x$$

$$3x - 16 < 20 \qquad /+16 \qquad\qquad 60 < 7x \qquad /:7$$

$$3x < 36 \qquad /:3 \qquad\qquad \frac{60}{7} < x$$

$$\underline{x < 12} \qquad\qquad\qquad \underline{8\frac{4}{7} < x}$$

$$\underline{L = \{9; 10; 11\}}$$

11. $$\frac{x}{3} \le \frac{2x-5}{8} - \frac{x-12}{6} \le x$$

$$\frac{x}{3} \le \frac{2x-5}{8} - \frac{x-12}{6} \qquad /\cdot 24 \qquad\qquad \frac{2x-5}{8} - \frac{x-12}{6} \le x \qquad /\cdot 24$$

$$8x \le 3(2x - 5) - 4(x - 12) \qquad\qquad 3(2x - 5) - 4(x - 12) \le 24x$$

$$8x \le 6x - 15 - 4x + 48 \qquad\qquad 6x - 15 - 4x + 48 \le 24x$$

$$8x \le 2x + 33 \qquad /-2x \qquad\qquad 2x + 33 \le 24x \qquad /-2x$$

$$6x \le 33 \qquad /:6 \qquad\qquad 33 \le 22x \qquad /:22$$

$$\underline{x \le 5{,}5} \qquad /-2x \qquad\qquad \underline{1{,}5 \le x}$$

$$\underline{L = \{2; 3; 4; 5\}}$$