MATHEMATIK G9C

Aufgabe	1	2	3	4	5	6	7	8	9	10
Punkte (max)	2	3	4	4	4	2	3	3	3	2
Punkte										

Löse folgende Gleichungen.

(1) $\quad 2(5 - x) - 3(x - 2) = 13x + 7$

(2) $\quad x + \dfrac{5}{2} + \dfrac{1}{x} = 0$

(3) $\quad \dfrac{15}{x} + 1 = \dfrac{16}{x - 1}$

(4) $\quad \dfrac{x}{x + 2} + 2 = -\dfrac{5}{x + 2}$

(5) $\quad \dfrac{1}{x + 3} + \dfrac{2}{x - 3} = \dfrac{2x - 1}{x^2 - 9}$

(6) $\quad (2x^2 - 20)(x^2 - 1) = 0$

(7) $\quad (2x + 1)^2 = 3x^2 + 1$

(8) $\quad 2x^3 + 7x^2 + 3x = 0$

(9) $\quad x^4 - 2x^2 = 15$

(10) $\quad \sqrt{x^2 + 7^2 + 4^2} = 9$

Lösungen

1.

$$2(3 - x) - 5(x - 2) = 13x + 6$$
$$6 - 2x - 5x + 10 = 13x + 6$$
$$16 - 7x = 13x + 6 \qquad \big| \ + 7x - 6$$
$$10 = 20x \qquad \big| \ : 20$$
$$x = \frac{1}{2}$$

2.

$$x + \frac{1}{x} = \frac{5}{2} \qquad \big| \ \cdot 2x$$
$$2x^2 + 2 = 5x \qquad \big| \ - 5x$$
$$2x^2 - 5x + 2 = 0$$
$$(2x - 1)(x - 2) = 0$$
$$x_1 = \frac{1}{2} \quad x_2 = 2$$

3.

$$\frac{5}{x} + \frac{1}{3} = \frac{4}{x - 1} \qquad \big| \ \cdot 3x(x - 1)$$
$$15(x - 1) + x(x - 1) = 12x$$
$$15x - 15 + x^2 - x = 12x \qquad \big| \ - 12x$$
$$x^2 + 2x - 15 = 0$$
$$(x + 5)(x - 3) = 0$$
$$x_1 = -5, \quad x_2 = 3$$

4.

$$\frac{x}{x + 2} + 1 = -\frac{5}{x + 2} \qquad \big| \ \cdot (x + 2)$$
$$x + x + 2 = 5 \qquad \big| \ - 2$$
$$2x = 3 \qquad \big| \ : 2$$
$$x = \frac{3}{2}$$

5.
$$\frac{1}{x-3} + \frac{2}{x+3} = \frac{2x+1}{x^2-9} \qquad \Big| \cdot (x-3)(x+3)$$
$$x + 3 + 2(x-3) = 2x + 1$$
$$x + 3 + 2x - 6 2x + 1 \qquad \Big| -2x + 3$$
$$x = 4$$

6.
$$(2x^2 - 1)(x^2 - 20) = 0$$
$$x_{1,2} = \pm\sqrt{\frac{1}{2}} \quad x_2 = \pm\sqrt{20}$$

7.
$$(2x-1)^2 = 3x^2 + 1$$
$$4x^2 - 4x + 1 = 3x^2 + 1 \quad \Big| -3x^2 - 1$$
$$x^2 - 4x = 0 \qquad x(x-4) \qquad = 0 \quad x_1 = 0 \quad x_2 = 4$$

8.
$$2x^3 - 7x^2 + 3x = 0$$
$$x(2x^2 - 7x + 3) = 0$$
$$x(2x-1)(x-3) = 0$$
$$x_1 = 0 \quad x_2 = \frac{1}{2} \quad x_3 = 3$$

9.
$$x^4 + 2x^2 = 15 \qquad \Big| -15$$
$$x^4 + 2x^2 - 15 = 0$$
$$(x^2 - 3)(x^2 + 5) = 0 \qquad x_{1,2} = \pm\sqrt{3}$$

10.
$$\sqrt{x^2 + 4^2 + 7^2} = 9 \qquad \Big|^2$$
$$x^2 + 65 = 81 \qquad \Big| -65$$
$$x^2 = 16 \qquad \Big| \sqrt{}$$
$$x_{1,2} = \pm 4.$$