



Aufgaben zu den quadratischen Gleichungen

1.0 Lösen Sie die folgenden Gleichungen durch Ausklammern.

$$1.1 \quad 3x^2 - 6x = 0$$

$$1.2 \quad x^2 - \frac{1}{3}x = 0$$

$$1.3 \quad \frac{3}{2}x^2 + \frac{5}{3}x = 0$$

$$1.4 \quad \frac{n}{p}x^2 + \frac{a}{b}x = 0$$

$$1.5 \quad 6ax^2 + 10bx = 0$$

$$1.6 \quad 6x^2 = \frac{2x}{5}$$

$$1.7 \quad (5x-1)(5x+1) - 10(x-1) = 9$$

$$1.8 \quad (x-4)^2 - (3x+2)(x-4) = 24$$

2.0 Zerlegen Sie die quadratischen Gleichungen zunächst in Faktoren und bestimmen Sie dann die Lösungsmenge.

$$2.1 \quad x^2 + 6x = 27$$

$$2.2 \quad 14x = x^2 - 51$$

$$2.3 \quad x^2 - \frac{2}{3}x - \frac{8}{9} = 0$$

$$2.4 \quad (x-4)(x+2) = 16$$

$$2.5 \quad (x-4)(x-7) = -2$$

$$2.6 \quad (x+7)^2 = 1$$

3.0 Ermitteln Sie die Lösungsmenge der folgenden Gleichungen durch Substitution.

$$3.1 \quad x^4 - 8x^2 - 9 = 0$$

$$3.2 \quad 2x^4 + x^2 - 10 = 0$$

$$3.3 \quad 36x^4 - 13x^2 + 1 = 0$$

4.0 Lösen Sie folgende quadratische Gleichungen mit einem Lösungsverfahren ihrer Wahl.

$$4.1 \quad x^2 - 4x + 4 = 49$$

$$4.2 \quad x^2 - 10x + 25 = 1$$

$$4.3 \quad x^2 + 6x + 9 = 0$$

$$4.4 \quad 2x^2 = 7x + 4$$

$$4.5 \quad 12x^2 + 15 = 29x$$

$$4.6 \quad 9x^2 - 3x = 2$$

$$4.7 \quad x^2 + \frac{1}{5}x = \frac{4}{5}$$

$$4.8 \quad x^2 - \frac{1}{4}x = \frac{1}{8}$$

$$4.9 \quad x^2 - 4\sqrt{2}x + 4 = 0$$

$$4.10 \quad x^2 + \sqrt{8}x + 1 = 0$$

$$4.11 \quad 2x^2 + 3\sqrt{2}x + 2 = 0$$

$$4.12 \quad x^2 + 4 = 3\sqrt{2}x$$

$$4.13 \quad (x^2 + 4)^2 - 25(x^2 + 4) + 100 = 0$$

$$4.14 \quad 2(x + \frac{1}{x})^2 - 7(x + \frac{1}{x}) + 5 = 0 \quad (\text{Substitution})$$

$$4.15 \quad (3x-2)^2 = 8(x+1)^2 - 100$$

$$4.16 \quad (4-x)(3x-7) - (x+2)^2 = x$$

$$4.17 \quad 23(2x-1)^2 - 8(3x-2)^2 = 5(2x+1)(2x-1)$$

$$4.18 \quad 2(x-\sqrt{2})^2 + (x+2\sqrt{2})^2 - 5(x+\sqrt{2})(x-\sqrt{2}) = 0$$

$$4.19 \quad (2x-\sqrt{2})^2 + (x+2\sqrt{2})^2 - 3(x-\sqrt{2})(x+2\sqrt{2}) = 20$$

Lösungen

$$1.1 \quad IL = \left\{ 0; 2 \right\}$$

$$1.2 \quad IL = \left\{ 0; \frac{1}{3} \right\}$$

$$1.3 \quad IL = \left\{ -\frac{10}{9}; 0 \right\}$$

$$1.4 \quad IL = \left\{ -\frac{ap}{nb}; 0 \right\}$$

$$1.5 \quad IL = \left\{ -\frac{5b}{3a}; 0 \right\}$$

$$1.6 \quad IL = \left\{ \frac{1}{15}; 0 \right\}$$

$$1.7 \quad IL = \left\{ 0; \frac{2}{5} \right\}$$

$$1.8 \quad IL = \left\{ 0; 1 \right\}$$

$$2.1 \quad IL = \left\{ -9; 3 \right\}$$

$$2.2 \quad IL = \left\{ -3; 17 \right\}$$

$$2.3 \quad IL = \left\{ -\frac{2}{3}; \frac{4}{3} \right\}$$

$$2.4 \quad IL = \left\{ -4; 6 \right\}$$

$$2.5 \quad IL = \left\{ 5; 6 \right\}$$

$$2.6 \quad IL = \left\{ -6; -8 \right\}$$

$$3.1 \quad IL = \left\{ -3; 3 \right\}$$

$$3.2 \quad IL = \left\{ -\sqrt{2}; \sqrt{2} \right\}$$

$$3.3 \quad IL = \left\{ -\frac{1}{2}; -\frac{1}{3}; \frac{1}{3}; \frac{1}{2} \right\}$$

$$4.1 \quad IL = \left\{ -5; 9 \right\}$$

$$4.2 \quad IL = \left\{ 4; 6 \right\}$$

$$4.3 \quad IL = \left\{ -3 \right\}$$

$$4.4 \quad IL = \left\{ -\frac{1}{2}; 4 \right\}$$

$$4.5 \quad IL = \left\{ \frac{3}{4}; \frac{5}{3} \right\}$$

$$4.6 \quad IL = \left\{ -\frac{1}{3}; \frac{2}{3} \right\}$$

$$4.7 \quad IL = \left\{ -1; \frac{4}{5} \right\}$$

$$4.8 \quad IL = \left\{ -\frac{1}{4}; \frac{1}{2} \right\}$$

$$4.9 \quad IL = \left\{ 2\sqrt{2}-2; 2\sqrt{2}+2 \right\}$$

$$4.10 \quad IL = \left\{ -\sqrt{2}-1; -\sqrt{2}+1 \right\}$$

$$4.11 \quad IL = \left\{ -\sqrt{2}; -\frac{1}{2}\sqrt{2} \right\}$$

$$4.12 \quad IL = \left\{ \sqrt{2}; 2\sqrt{2} \right\}$$

$$4.13 \quad IL = \left\{ -4; -1; 1; 4 \right\}$$

$$4.14 \quad IL = \left\{ \frac{1}{2}; 2 \right\}$$

$$4.15 \quad IL = \left\{ 4; 24 \right\}$$

$$4.16 \quad IL = \left\{ \quad \right\}$$

$$4.17 \quad IL = \left\{ 1 \right\}$$

$$4.18 \quad IL = \left\{ -\sqrt{11}; \sqrt{11} \right\}$$

$$4.19 \quad IL = \left\{ \frac{1}{2}\sqrt{2}; \sqrt{2} \right\}$$