

Los de volgende vergelijkingen op. Schrijf de berekeningen goed en duidelijk op.

1) $x^2 + 4x - 21 = 0$

2) $x^2 + 5 = 8$

3) $2x^2 + 3 = 2 - x^2$

4) $2x^2 - 4x - 5 = 0$

5) $6x^2 + 16x - 2 = 0$

6) $6x^2 + 16x + 2 = 0$

7) $4x^2 = 12x - 9$

8) $12x^2 - 32x + 20 = 0$

9) $3x(5x - 4)(x - 7) = 0$

10) $2x^2 + 10x = 28$

11) $3x^2 - 5x - 11 = 0$

12) $\frac{1}{2}x^2 + 6\frac{1}{2}x = -20$

$$1) \quad x^2 + 4x - 21 = 0$$

$$(x+7)(x-3) = 0$$

$$x+7=0 \vee x-3=0$$

$$\underline{\underline{x = -7 \vee x = 3}}$$

$$2) \quad x^2 + 5 = 8$$

$$x^2 = 8 - 5$$

$$x^2 = 3$$

$$\underline{\underline{x_{1,2} = \pm \sqrt{3}}}$$

$$3) \quad 2x^2 + 3 = 2 - x^2$$

$$2x^2 + x^2 + 3 - 2 = 0$$

$$3x^2 + 1 = 0$$

$$3x^2 = -1$$

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

$$\underline{\underline{\text{geen oplossingen}}}$$

$$4) \quad 2x^2 - 4x - 5 = 0$$

$$a = (2) \quad b = (-4) \quad c = (-5)$$

$$D = b^2 - 4ac$$

$$= 16 - (4 \cdot 2 \cdot -5)$$

$$= 16 + 40 = 56 = 2 \cdot 28$$

$$= 2 \cdot 2 \cdot 14$$

$$\sqrt{D} = 2\sqrt{14}$$

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$$

$$= \frac{4 \pm 2\sqrt{14}}{4}$$

$$= 1 \pm \frac{2}{4}\sqrt{14}$$

$$\underline{\underline{x_{1,2} = 1 \pm \frac{1}{2}\sqrt{14}}}$$

$$5) \quad 6x^2 + 16x - 2 = 0$$

$$3x^2 + 8x - 1 = 0$$

$$a = (3) \quad b = (8) \quad c = (-1)$$

$$D = b^2 - 4ac$$

$$= 64 - (4 \cdot 3 \cdot -1)$$

$$= 64 + 12 = 76$$

$$= 2 \cdot 38 = 2 \cdot 2 \cdot 19$$

$$\sqrt{D} = 2\sqrt{19}$$

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$$

$$= \frac{-8 \pm 2\sqrt{19}}{6}$$

$$= -\frac{8}{6} \pm \frac{2}{6}\sqrt{19}$$

$$= -\frac{4}{3} \pm \frac{1}{3}\sqrt{19}$$

$$\underline{\underline{x_{1,2} = -\frac{4}{3} \pm \frac{1}{3}\sqrt{19}}}$$

$$6) \quad 6x^2 + 16x + 2 = 0$$

$$3x^2 + 8x + 1 = 0$$

$$a = (3) \quad b = (8) \quad c = (1)$$

$$D = b^2 - 4ac$$

$$= 64 - (4 \cdot 3 \cdot 1)$$

$$= 64 - 12 = 52$$

$$= 2 \cdot 26 = 2 \cdot 2 \cdot 13$$

$$\sqrt{D} = 2\sqrt{13}$$

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$$

$$= \frac{-8 \pm 2\sqrt{13}}{6}$$

$$= -\frac{8}{6} \pm \frac{2}{6}\sqrt{13}$$

$$= -\frac{4}{3} \pm \frac{1}{3}\sqrt{13}$$

$$\underline{\underline{x_{1,2} = -\frac{4}{3} \pm \frac{1}{3}\sqrt{13}}}$$

$$7) \quad 4x^2 = 12x - 9$$

$$4x^2 - 12x + 9 = 0$$

$$a = (4) \quad b = (-12) \quad c = (9)$$

$$D = b^2 - 4ac = 144 - (4 \cdot 4 \cdot 9)$$

$$= 144 - 144 = 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a} = \frac{12 \pm 0}{8} = \frac{3}{2}$$

$$\underline{\underline{x = 1\frac{1}{2}}}$$

$$8) \quad 12x^2 - 32x + 20 = 0$$

$$6x^2 - 16x + 10 = 0$$

$$3x^2 - 8x + 5 = 0$$

$$a = (3) \quad b = (-8) \quad c = (5)$$

$$D = b^2 - 4ac = 64 - (4 \cdot 3 \cdot 5) = 64 - 60 = 4$$

$$\sqrt{D} = 2$$

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$$

$$= \frac{8 \pm 2}{6} = \frac{10}{6} = 1\frac{4}{6} = 1\frac{2}{3}$$

$$= \frac{6}{6} = 1$$

$$\underline{\underline{x = 1\frac{2}{3} \vee x = 1}}$$

$$9) \quad 3x(5x - 4)(x - 7) = 0$$

$$3x = 0 \vee 5x - 4 = 0 \vee x - 7 = 0$$

$$x = 0 \vee 5x = 4 \vee x = 7$$

$$x = 0 \vee x = \frac{4}{5} \vee x = 7$$

$$10) \quad 2x^2 + 10x = 28$$

$$2x^2 + 10x - 28 = 0$$

$$x^2 + 5x - 14 = 0$$

$$(x+7)(x-2) = 0$$

$$\underline{\underline{x = -7 \vee x = 2}}$$

$$11) \quad 3x^2 - 5x - 11 = 0$$

$$a = (3) \quad b = (-5) \quad c = (-11)$$

$$D = b^2 - 4ac = 25 - (4 \cdot 3 \cdot -11) = 25 + 132 = 157$$

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a} = \frac{5 \pm \sqrt{157}}{6} = \frac{5}{6} \pm \frac{1}{6}\sqrt{157}$$

$$12) \quad \frac{1}{2}x^2 + 6\frac{1}{2}x = -20$$

$$x^2 + 13x = -40$$

$$x^2 + 13x + 40 = 0$$

$$(x+5)(x+8) = 0$$

$$\underline{\underline{x = -5 \vee x = -8}}$$

