Wiskunde voor bachelor en master

Deel 1 Basiskennis en basisvaardigheden



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**Uitwerkingen Hoofdstuk 8**

1. a. $\frac{2\cdot 4\cdot 6}{4} = 2\cdot 6 = 12$

   b. $\frac{2+3+6}{4} = \frac{11}{4} = 2\frac{3}{4}$

   c. $\frac{21\cdot 6}{7\cdot 3} = \frac{7\cdot 3\cdot 6}{7\cdot 3} = 6$

   d. $\frac{21\cdot 6}{7+3} = \frac{21\cdot 6}{10} = \frac{21\cdot 3\cdot 2}{5\cdot 2} = \frac{63}{5} = 12\frac{3}{5}$

   e. $-\frac{8-10}{-2} = -\frac{-2}{-2} = -1$

   f. $\frac{23\cdot -2}{-1} = \frac{-46}{-1} = 46$

2. a. $3\frac{1}{4} + 4\frac{1}{5} = 3\frac{5}{20} + 4\frac{4}{20} = 7\frac{9}{20}$

   b. $3\frac{1}{4} - 4\frac{1}{5} = 3\frac{5}{20} - 4\frac{4}{20} = 3\frac{5}{20} - 3\frac{24}{20} = -\frac{19}{20}$

   c. $3\frac{1}{4} \cdot 4\frac{1}{5} = \frac{13}{4}\cdot\frac{21}{5} = \frac{273}{20} = 13\frac{13}{20}$

   d. $3\frac{1}{4} : 4\frac{1}{5} == \frac{13}{4} : \frac{21}{5} = \frac{13}{4}\cdot\frac{5}{21} = \frac{65}{84}$

   e. $\frac{3}{5} : \frac{1}{5} = \frac{3}{5}\cdot\frac{5}{1} = 3$

   f. $\frac{3}{5} : 5 = \frac{3}{5}\cdot\frac{1}{5} = \frac{3}{25}$

3. a. $\frac{x}{x-1} - \frac{1}{x+1} = \frac{x(x+1)}{(x-1)(x+1)} - \frac{x-1}{(x-1)(x+1)} = \frac{x^2+x-x+1}{(x-1)(x+1)} = \frac{x^2+1}{x^2-1}$

   b. $\frac{1}{3} - \frac{x}{2x-1} = \frac{2x-1}{3(2x-1)} - \frac{3x}{3(2x-1)} = \frac{2x-1-3x}{3(2x-1)} = \frac{-x-1}{3(2x-1)} = -\frac{x+1}{3(2x-1)}$

   c. $\frac{1}{\sqrt{p}} - \frac{1}{\sqrt{q}} = \frac{\sqrt{q}}{\sqrt{pq}} - \frac{\sqrt{p}}{\sqrt{pq}} = \frac{\sqrt{q}-\sqrt{p}}{\sqrt{pq}}$

   d. $\frac{1}{a+b} + \frac{b}{a^2-b^2} = \frac{a-b}{a^2-b^2} + \frac{b}{a^2-b^2} = \frac{a}{a^2-b^2}$

   e. $t + \frac{1}{t} + \frac{1}{t^2} = \frac{t^3}{t^2} + \frac{t}{t^2} + \frac{1}{t^2} = \frac{t^3+t+1}{t^2}$

   f. $\frac{1}{xy} - \frac{y}{x} + \frac{x}{y} = \frac{1}{xy} - \frac{y^2}{xy} + \frac{x^2}{xy} = \frac{x^2-y^2+1}{xy}$

4. a. $\frac{1}{p} + \frac{1}{q} = \frac{q}{pq} + \frac{p}{pq} = \frac{p+q}{pq}$

   b. $-a(\frac{1}{p} - \frac{1}{q}) = -a(\frac{q}{pq} - \frac{p}{pq}) = -a(\frac{q-p}{pq}) = \frac{a(p-q)}{pq}$

   c. $\frac{1}{p} \cdot \frac{1}{q} = \frac{1}{pq}$

   d. $\frac{1}{p} : \frac{1}{q} = \frac{1}{p}\cdot\frac{q}{1} = \frac{q}{p}$

e. $\dfrac{1}{\dfrac{1}{p}+1} = \dfrac{p\cdot 1}{p\cdot(\dfrac{1}{p}+1)} = \dfrac{p}{1+p} = \dfrac{p}{p+1}$

f. $\dfrac{1}{\dfrac{1}{p}:\dfrac{1}{q}} = \dfrac{1}{\dfrac{1}{p}\cdot\dfrac{q}{1}} = \dfrac{1}{(\dfrac{q}{p})} = 1\cdot\dfrac{p}{q} = \dfrac{p}{q}$

5. a. $\dfrac{1}{x+1} : \dfrac{1}{x-1} = \dfrac{1}{x+1}\cdot\dfrac{x-1}{1} = \dfrac{x-1}{x+1}$

b. $\dfrac{1}{x+1}\cdot\dfrac{x}{x-1} = \dfrac{x}{(x+1)(x-1)} = \dfrac{x}{x^2-1}$

c. $\dfrac{1}{\sqrt{3}} : \dfrac{1}{\sqrt{6}} = \dfrac{1}{\sqrt{3}}\cdot\dfrac{\sqrt{6}}{1} = \dfrac{\sqrt{6}}{\sqrt{3}} = \dfrac{\sqrt{2}\cdot\sqrt{3}}{\sqrt{3}} = \sqrt{2}$

d. $\dfrac{abx}{a^2xy^2}\cdot y = \dfrac{abxy}{a^2xy^2} = \dfrac{b}{ay}$

e. $v(1-2v)+v(2v-1) = v-2v^2+2v^2-v = 0$

f. $\dfrac{2}{3} - \dfrac{a}{a+b} = \dfrac{2(a+b)}{3(a+b)} - \dfrac{3a}{3(a+b)} = \dfrac{2a+2b-3a}{3(a+b)} = \dfrac{2b-a}{3(a+b)}$

6. a. $2\sqrt{8}-8\sqrt{2} = 2\cdot 2\sqrt{2}-8\sqrt{2} = 4\sqrt{2}-8\sqrt{2} = -4\sqrt{2}$

b. $14\sqrt{8}\cdot 2\sqrt{2} = 14\cdot 2\sqrt{2}\cdot 2\sqrt{2} = 14\cdot 4\cdot 2 = 112$

c. $16^{\frac{2}{3}} = (2^4)^{\frac{2}{3}} = 2^{4\cdot\frac{2}{3}} = 2^{\frac{8}{3}} = 2^{2\frac{2}{3}} = 2^2\sqrt[3]{2^2} = 4\sqrt[3]{4}$

d. $\sqrt[5]{16^2} = 16^{\frac{2}{5}} = (2^4)^{\frac{2}{5}} = 2^{4\cdot\frac{2}{5}} = 2^{\frac{8}{5}} = 2^{1\frac{3}{5}} = 2\cdot 2^{\frac{3}{5}} = 2\sqrt[5]{2^3} = 2\sqrt[5]{8}$

e. $\left(\frac{1}{3}\right)^{-\frac{2}{3}} = \left(3^{-1}\right)^{-\frac{2}{3}} = 3^{\frac{2}{3}} = \sqrt[3]{3^2} = \sqrt[3]{9}$

f. $(-2\sqrt[3]{4})^4 = (-2)^4\cdot(\sqrt[3]{4})^4 = 2^4\cdot\left(2^{\frac{2}{3}}\right)^4 = 2^4\cdot 2^{\frac{8}{3}} = 2^4\cdot 2^2\sqrt[3]{2^2} = 64\sqrt[3]{4}$

7. a. $\left(\dfrac{6}{\sqrt[3]{p}}\right)^4 = \left(\dfrac{6}{p^{\frac{1}{3}}}\right)^4 = \dfrac{6^4}{p^{\frac{4}{3}}} = \dfrac{6^4}{p^{1\frac{1}{3}}} = \dfrac{6^4}{p\sqrt[3]{p}} = \dfrac{1296}{p\sqrt[3]{p}}$

b. $\left(\dfrac{1}{\sqrt[4]{p}}\right)^6 = \left(p^{-\frac{1}{4}}\right)^6 = p^{-\frac{6}{4}} = p^{-\frac{3}{2}} = \dfrac{1}{p^{1\frac{1}{2}}} = \dfrac{1}{p\sqrt{p}}$

c. $2\dfrac{p^2}{\sqrt[3]{p}} = 2\dfrac{p^2}{p^{\frac{1}{3}}} = 2p^{2-\frac{1}{3}} = 2p^{1\frac{2}{3}} = 2p\sqrt[3]{p^2}$

d. $\dfrac{3p^3+2p\sqrt{p}}{p\sqrt{3p^3}} = \dfrac{3p^2+2\sqrt{p}}{\sqrt{3p^3}} = \dfrac{3p^2+2\sqrt{p}}{p\sqrt{p}\cdot\sqrt{3}} = \dfrac{3p^2}{p\sqrt{p}\cdot\sqrt{3}} + \dfrac{2\sqrt{p}}{p\sqrt{p}\cdot\sqrt{3}} = \sqrt{3p} + \dfrac{2}{p\sqrt{3}}$

8. $\sqrt[p]{\sqrt[q]{x}} = \sqrt[p]{x^{\frac{1}{q}}} = \left(x^{\frac{1}{q}}\right)^{\frac{1}{p}} = x^{\frac{1}{p}\cdot\frac{1}{q}} = x^{\frac{1}{pq}}$

$\sqrt[3]{4}\cdot\sqrt{\sqrt[3]{4}} = 4^{\frac{1}{3}}\cdot 4^{\frac{1}{6}} = 4^{\frac{1}{3}+\frac{1}{6}} = 4^{\frac{1}{2}} = \sqrt{4} = 2$

9. a. $(3x-y)^2 = (3x)^2 - 2\cdot 3x\cdot y + y^2 = 9x^2 - 6xy + y^2$

b. $(a+b)32 = 32a + 32b$

c. $(2x+1)(2x-1)(4x^2+1) = (4x^2-1)(4x^2+1) = 16x^4 - 1$

d. $(4x-\sqrt{3})(4x+\sqrt{3}) = 16x^2 - 3$

e. $\sqrt{2x+1} - \dfrac{2x}{\sqrt{2x+1}} = \dfrac{2x+1}{\sqrt{2x+1}} - \dfrac{2x}{\sqrt{2x+1}} = \dfrac{1}{\sqrt{2x+1}}$

f. $\dfrac{1}{\sqrt{5}-1} = \dfrac{\sqrt{5}+1}{(\sqrt{5}+1)(\sqrt{5}-1)} = \dfrac{\sqrt{5}+1}{5-1} = \dfrac{1+\sqrt{5}}{4} = \frac{1}{4} + \frac{1}{4}\sqrt{5}$

10. a. $x^3 - x^2 = x^2(x-1)$

b. $t^3 - t = t(t^2-1) = t(t+1)(t-1)$

c. $t^2 + 5t + 6 = (t+2)(t+3)$

d. $2t^2 - 8t + 6 = 2(t^2 - 4t + 3) = 2(t-1)(t-3)$

e. $1 - t^4 = (1-t^2)(1+t^2) = (1-t)(1+t)(1+t^2)$

f. $3v^2 - 12v - 63 = 3(v^2 - 4v - 21) = 3(v-7)(v+3)$

11. a.

| | | |
|---|---|---|
| | $2x + 3p = -x + 6$ | $\{-x$ naar links, $3p$ naar rechts$\}$ |
| $\Leftrightarrow$ | $3x = 6 - 3p$ | {deel door 3} |
| $\Leftrightarrow$ | $x = 2 - p$ | |

b.

| | | |
|---|---|---|
| | $\frac{1}{2}xp = \dfrac{x-1}{4}$ | {maal 4} |
| $\Leftrightarrow$ | $2xp = x - 1$ | $\{x$ naar links$\}$ |
| $\Leftrightarrow$ | $2xp - x = -1$ | $\{x$ buiten haakjes halen$\}$ |
| $\Leftrightarrow$ | $x(2p-1) = -1$ | {deel door $2p-1$} |
| $\Leftrightarrow$ | $x = \dfrac{-1}{2p-1} = \dfrac{1}{1-2p}$ | |

c.

| | | |
|---|---|---|
| | $4x - a = 3x - b$ | $\{3x$ naar links, $-a$ naar rechts$\}$ |
| $\Leftrightarrow$ | $x = a - b$ | |

d.

$$\begin{aligned}
& a(x-1) = \frac{x+1}{a} && \{\text{maal } a\text{, voorwaarde } a \neq 0\} \\
\Leftrightarrow\ & a^2(x-1) = x+1 && \{\text{haakjes uitwerken}\} \\
\Leftrightarrow\ & a^2x - a^2 = x+1 && \{x \text{ naar links, } -a^2 \text{ naar rechts}\} \\
\Leftrightarrow\ & a^2x - x = a^2+1 && \{x \text{ buiten haakjes halen}\} \\
\Leftrightarrow\ & x(a^2-1) = a^2+1 && \{\text{deel door } a^2-1\} \\
\Leftrightarrow\ & x = \frac{a^2+1}{a^2-1}, \text{ mits } a \neq 0
\end{aligned}$$

De oplossing is $x = \dfrac{a^2+1}{a^2-1}$, voor $a \neq 0$.

Uiteraard mag de noemer niet 0 zijn en is er ook geen oplossing voor $a = 1$ of $a = -1$, maar omdat je dat aan het antwoord kunt zien, schrijf je die voorwaarden er niet bij.

e.

$$\begin{aligned}
& (x-a)(x-b) = x(x+1) && \{\text{haakjes uitwerken}\} \\
\Leftrightarrow\ & x^2 - (a+b)x + ab = x^2 + x && \{x^2 + x \text{ naar links, } ab \text{ naar rechts}\} \\
\Leftrightarrow\ & -x^2 - x + x^2 - (a+b)x = -ab \\
\Leftrightarrow\ & -x - (a+b)x = -ab \\
\Leftrightarrow\ & x + (a+b)x = ab \\
\Leftrightarrow\ & (1+a+b)x = ab \\
\Leftrightarrow\ & x = \frac{ab}{1+a+b}
\end{aligned}$$

f.

$$\begin{aligned}
& a(2x+1) = \frac{b}{2x-1} && \{\text{maal } 2x-1\text{, voorwaarde } x \neq \tfrac{1}{2}\} \\
\Leftrightarrow\ & a(2x+1)(2x-1) = b && \{\text{haakjes uitwerken}\} \\
\Leftrightarrow\ & a(4x^2-1) = b && \{\text{deel door } a\} \\
\Leftrightarrow\ & 4x^2 - 1 = \frac{b}{a} && \{-1 \text{ naar rechts}\} \\
\Leftrightarrow\ & 4x^2 = \frac{a+b}{a} && \{\text{deel door } 4\} \\
\Leftrightarrow\ & x^2 = \frac{a+b}{4a} && \{\text{standaardvergelijking}\} \\
\Leftrightarrow\ & x = \sqrt{\frac{a+b}{4a}} \ \vee\ x = -\sqrt{\frac{a+b}{4a}} \\
\Leftrightarrow\ & x = \tfrac{1}{2}\sqrt{\frac{a+b}{a}} \ \vee\ x = -\tfrac{1}{2}\sqrt{\frac{a+b}{a}}, \text{ mits } x \neq \tfrac{1}{2}
\end{aligned}$$

Geldt bijvoorbeeld $b = 0$, dan vind je $x = \frac{1}{2} \vee x = -\frac{1}{2}$ en de eerste hiervan voldoet niet.

12. a.

$$
\begin{aligned}
& 3x - 1 \le x + 4 && \{x \text{ naar links, } -1 \text{ naar rechts}\} \\
\Leftrightarrow\ & 2x \le 5 && \{\text{deel door } 2\} \\
\Leftrightarrow\ & x \le 2\tfrac{1}{2}
\end{aligned}
$$

b.

$$
\begin{aligned}
& x - 4 \ge 3x + 4 && \{3x \text{ naar links, } -4 \text{ naar rechts}\} \\
\Leftrightarrow\ & -2x \ge 8 && \{\text{deel door } -2\text{, teken klapt om}\} \\
\Leftrightarrow\ & x \le -4
\end{aligned}
$$

c.

$$
\begin{aligned}
& 2(1 - 3x) > 4(x - 4) && \{\text{haakjes uitwerken}\} \\
\Leftrightarrow\ & 2 - 6x > 4x - 16 && \{4x \text{ naar links, } 2 \text{ naar rechts}\} \\
\Leftrightarrow\ & -10x > -18 && \{\text{deel door } -10\text{, teken klapt om}\} \\
\Leftrightarrow\ & x < 1\tfrac{4}{5}
\end{aligned}
$$

d.

$$
\begin{aligned}
& 1 + x\sqrt{3} < 7 - x\sqrt{3} && \{-x\sqrt{3} \text{ naar links, } 1 \text{ naar rechts}\} \\
\Leftrightarrow\ & 2x\sqrt{3} < 6 && \{\text{deel door } 2\sqrt{3}\} \\
\Leftrightarrow\ & x < \frac{6}{2\sqrt{3}} && \{\text{vereenvoudig}\} \\
\Leftrightarrow\ & x < \sqrt{3}
\end{aligned}
$$

e.

$$
\begin{aligned}
& 4(x - 1) < 4x - 1 && \{\text{haakjes uitwerken}\} \\
\Leftrightarrow\ & 4x - 4 < 4x - 1 && \{4x \text{ naar links, } -4 \text{ naar rechts}\} \\
\Leftrightarrow\ & 0 < 3 && \{\text{dit geldt voor alle waarden van } x\} \\
\Leftrightarrow\ & x \in \mathbb{R} \ \ (\text{elke waarde van } x \text{ voldoet})
\end{aligned}
$$

f.

$$
\begin{aligned}
& \tfrac{2}{3}x > \tfrac{1}{3}x + 4 && \{\text{maal } 3\} \\
\Leftrightarrow\ & 2x > x + 12 && \{x \text{ naar links}\} \\
\Leftrightarrow\ & x > 12
\end{aligned}
$$

13. a.

$$2x^2 - 5x + 2 = 0 \qquad \{\text{discriminant: } (-5)^2 - 4{\cdot}2{\cdot}2 = 9\}$$
$$\Leftrightarrow \quad x_{1,2} = \frac{5 \pm \sqrt{9}}{4} = \frac{5 \pm 3}{4}$$
$$\Leftrightarrow \quad x = 2 \ \vee \ x = \tfrac{1}{2}$$

b.

$$2x^2 + 5x + 2 = 0 \qquad \{\text{discriminant: } 5^2 - 4{\cdot}2{\cdot}2 = 9\}$$
$$\Leftrightarrow \quad x_{1,2} = \frac{-5 \pm \sqrt{9}}{4} = \frac{-5 \pm 3}{4}$$
$$\Leftrightarrow \quad x = -2 \ \vee \ x = -\tfrac{1}{2}$$

c.

$$4x^2 - 5x\sqrt{2} + 2 = 0 \qquad \{\text{discriminant: } (-5\sqrt{2})^2 - 4{\cdot}4{\cdot}2 = 18\}$$
$$\Leftrightarrow \quad x_{1,2} = \frac{5\sqrt{2} \pm \sqrt{18}}{8} = \frac{5\sqrt{2} \pm 3\sqrt{2}}{8}$$
$$\Leftrightarrow \quad x = \sqrt{2} \ \vee \ x = \tfrac{1}{4}\sqrt{2}$$

d.

$$4x^2 + 5x\sqrt{2} + 2 = 0 \qquad \{\text{discriminant: } (5\sqrt{2})^2 - 4{\cdot}4{\cdot}2 = 18\}$$
$$\Leftrightarrow \quad x_{1,2} = \frac{-5\sqrt{2} \pm \sqrt{18}}{8} = \frac{-5\sqrt{2} \pm 3\sqrt{2}}{8}$$
$$\Leftrightarrow \quad x = -\sqrt{2} \ \vee \ x = -\tfrac{1}{4}\sqrt{2}$$

e.

$$2x^2 - 5x\sqrt{2} + 4 = 0 \qquad \{\text{discriminant: } (-5\sqrt{2})^2 - 4{\cdot}2{\cdot}4 = 18\}$$
$$\Leftrightarrow \quad x_{1,2} = \frac{5\sqrt{2} \pm \sqrt{18}}{4} = \frac{5\sqrt{2} \pm 3\sqrt{2}}{4}$$
$$\Leftrightarrow \quad x = \tfrac{1}{2}\sqrt{2} \ \vee \ x = 2\sqrt{2}$$

f.

$$2x^2 + 5x\sqrt{2} + 4 = 0 \qquad \{\text{discriminant: } (5\sqrt{2})^2 - 4{\cdot}2{\cdot}4 = 18\}$$
$$\Leftrightarrow \quad x_{1,2} = \frac{-5\sqrt{2} \pm \sqrt{18}}{4} = \frac{-5\sqrt{2} \pm 3\sqrt{2}}{4}$$
$$\Leftrightarrow \quad x = -\tfrac{1}{2}\sqrt{2} \ \vee \ x = -2\sqrt{2}$$

14. a.

$$\begin{aligned} & (2t-1)^3 = -1 && \{\text{standaardvergelijking}\} \\ \Leftrightarrow\ & 2t-1 = \sqrt[3]{-1} = -1 \\ \Leftrightarrow\ & 2t = 0 \\ \Leftrightarrow\ & t = 0 \end{aligned}$$

b.

$$\begin{aligned} & (t-1)^4 = 81 && \{\text{standaardvergelijking}\} \\ \Leftrightarrow\ & t-1 = \pm\sqrt[4]{81} = \pm 3 \\ \Leftrightarrow\ & t = 1 \pm 3 \\ \Leftrightarrow\ & t = 4 \ \vee\ t = -2 \end{aligned}$$

c.

$$\begin{aligned} & (t+\frac{1}{t})^2 = 4 && \{\text{standaardvergelijking}\} \\ \Leftrightarrow\ & t+\frac{1}{t} = 2 \ \vee\ t+\frac{1}{t} = -2 && \{\text{links en rechts maal } t\text{, voorwaarde: } t \neq 0\} \\ \Leftrightarrow\ & t^2+1 = 2t \ \vee\ t^2+1 = -2t \\ \Leftrightarrow\ & t^2-2t+1 = 0 \ \vee\ t^2+2t+1 = 0 \\ \Leftrightarrow\ & (t-1)^2 = 0 \ \vee\ (t+1)^2 = 0 \\ \Leftrightarrow\ & t = 1 \ \vee\ t = -1 \end{aligned}$$

d.

$$\begin{aligned} & (1-t)^3 = A && \{\text{standaardvergelijking}\} \\ \Leftrightarrow\ & 1-t = \sqrt[3]{A} \\ \Leftrightarrow\ & t = 1-\sqrt[3]{A} \end{aligned}$$

e.

$$\begin{aligned} & (t-a)(t-b) = a\cdot b && \{\text{haakjes uitwerken}\} \\ \Leftrightarrow\ & t^2-(a+b)t+ab = ab \\ \Leftrightarrow\ & t^2-(a+b)t = 0 \\ \Leftrightarrow\ & t(t-(a+b)) = 0 \\ \Leftrightarrow\ & t = 0 \ \vee\ t = a+b \end{aligned}$$

f.

$$\begin{aligned} & t^6+t^3 = 12 && \{\text{substitutie } t^3 = x\text{, equivalent met } t = \sqrt[3]{x}\} \\ \Leftrightarrow\ & x^2+x-12 = 0 \\ \Leftrightarrow\ & (x-3)(x+4) = 0 \\ \Leftrightarrow\ & x = 3 \ \vee\ x = -4 && \{t = \sqrt[3]{x}\} \\ \Leftrightarrow\ & t = \sqrt[3]{3} \ \vee\ t = -\sqrt[3]{4} \end{aligned}$$

15. De discriminant van de vergelijking $ax^2 + 6x + 1 = 0$ is $36 - 4a$. Hiervoor moet gelden:

$$\begin{aligned} & 36 - 4a < 0 && \{36 \text{ naar rechts}\} \\ \Leftrightarrow\quad & -4a < -36 && \{\text{deel door } -4, \text{ teken klapt om}\} \\ \Leftrightarrow\quad & a > 9 && \end{aligned}$$

Dus voor $a > 9$ heeft deze vergelijking geen oplossingen.

16.

$$\begin{aligned} & 2\omega = 2 + \sqrt{2\omega + 10} && \{2 \text{ naar links}\} \\ \Leftrightarrow\quad & 2\omega - 2 = \sqrt{2\omega + 10} && \{\text{kwadrateer, geen equivalentie!}\} \\ \Rightarrow\quad & 4\omega^2 - 8\omega + 4 = 2\omega + 10 && \{\text{herleid tot 0 en deel door 2}\} \\ \Leftrightarrow\quad & 2\omega^2 - 5\omega - 3 = 0 && \{\text{discriminant is } 25 - 4\cdot 2\cdot -3 = 49\} \\ \Leftrightarrow\quad & \omega_{1,2} = \frac{5 \pm 7}{4} && \\ \Leftrightarrow\quad & \omega = 3 \ \vee\ \omega = -\tfrac{1}{2} && \end{aligned}$$

Controle:

$\omega = 3:\ 2\cdot 3 = 2 + \sqrt{2\cdot 3 + 10}$ levert: $6 = 2 + 4$ en dat is juist.
$\omega = -\frac{1}{2}:\ 2\cdot -\frac{1}{2} = 2 + \sqrt{2\cdot -\frac{1}{2} + 10}$ levert: $-1 = 2 + 3$ en dat is onjuist.

Conclusie: $\omega = 3$ is de enige oplossing van deze vergelijking.