

Diagnostische toets

bladzijde 70

- 1** a $6x^2 + 9x = 3x(2x + 3)$
b $8pq + 5p = p(8q + 5)$
c $5x^2 - x = x(5x - 1)$
d $10a^2b + 15ab = 5ab(2a + 3)$
- 2** a $36x^2 - 24xy = 12x(3x - 2y)$
b $12x^6 - 4x^2 = 4x^2(3x^4 - 1)$
c $5x^2y + xy - 2xy^2 = xy(5x + 1 - 2y)$
d $x^4 - x^2 + x = x(x^3 - x + 1)$
- 3** a $x^2 + 10x + 21 = (x + 3)(x + 7)$
b $x^2 + 10x - 24 = (x - 2)(x + 12)$
c $3x^2 - 4x = x(3x - 4)$
d $x^2 - 4x - 32 = (x - 8)(x + 4)$
e $x^2 + x - 56 = (x - 7)(x + 8)$
f $x^2 - 8x - 48 = (x + 4)(x - 12)$
- 4** a $(x - 7)(x + 8) = 0$
 $x - 7 = 0$ of $x + 8 = 0$
 $x = 7$ of $x = -8$
b $-5x(2x + 3) = 0$
 $-5x = 0$ of $2x + 3 = 0$
 $x = 0$ of $2x = -3$
 $x = 0$ of $x = -1\frac{1}{2}$
c $(3x + 8)(x - 8) = 0$
 $3x + 8 = 0$ of $x - 8 = 0$
 $3x = -8$ of $x = 8$
 $x = -\frac{8}{3}$ of $x = 8$
d $3x(8x - 3) = 0$
 $3x = 0$ of $8x - 3 = 0$
 $x = 0$ of $8x = 3$
 $x = 0$ of $x = \frac{3}{8}$
- 5** a $x^2 + 9x + 14 = 0$
 $(x + 2)(x + 7) = 0$
 $x + 2 = 0$ of $x + 7 = 0$
 $x = -2$ of $x = -7$
b $x^2 - 6x = 0$
 $x(x - 6) = 0$
 $x = 0$ of $x = -6$
 $x = 0$ of $x = 6$
c $x^2 - 5x - 14 = 0$
 $(x + 2)(x - 7) = 0$
 $x + 2 = 0$ of $x - 7 = 0$
 $x = -2$ of $x = 7$
d $5x^2 - 20x = 0$
 $5x(x - 4) = 0$
 $5x = 0$ of $x - 4 = 0$
 $x = 0$ of $x = 4$
e $3x^2 + x = 0$
 $x(3x + 1) = 0$
 $x = 0$ of $3x + 1 = 0$
 $x = 0$ of $3x = -1$
 $x = 0$ of $x = -\frac{1}{3}$
f $x^2 - x - 30 = 0$
 $(x + 5)(x - 6) = 0$
 $x + 5 = 0$ of $x - 6 = 0$
 $x = -5$ of $x = 6$

6 a $x^2 - 7x = 8$

$$\begin{array}{l} \boxed{-8} \quad \boxed{-8} \\ x^2 - 7x - 8 = 0 \\ (x+1)(x-8) = 0 \\ x+1=0 \text{ of } x-8=0 \\ x=-1 \text{ of } x=8 \end{array}$$

b $x^2 = 7x$

$$\begin{array}{l} \boxed{-7x} \quad \boxed{-7x} \\ x^2 - 7x = 0 \\ x(x-7) = 0 \\ x=0 \text{ of } x-7=0 \\ x=0 \text{ of } x=7 \end{array}$$

c $x^2 = 4x + 5$

$$\begin{array}{l} \boxed{-5} \quad \boxed{-5} \\ x^2 - 5 = 4x \\ \boxed{-4x} \quad \boxed{-4x} \\ x^2 - 4x - 5 = 0 \\ (x+1)(x-5) = 0 \\ x+1=0 \text{ of } x-5=0 \\ x=-1 \text{ of } x=5 \end{array}$$

d $x^2 - x = 2x$

$$\begin{array}{l} \boxed{-2x} \quad \boxed{-2x} \\ x^2 - 3x = 0 \\ x(x-3) = 0 \\ x=0 \text{ of } x-3=0 \\ x=0 \text{ of } x=3 \end{array}$$

e $(3x-1)(x+5) = 0$

$$\begin{array}{l} 3x-1=0 \text{ of } x+5=0 \\ 3x=1 \text{ of } x=-5 \\ x=\frac{1}{3} \text{ of } x=-5 \end{array}$$

f $x^2 + 7x + 6 = 2x + 6$

$$\begin{array}{l} \boxed{-6} \quad \boxed{-6} \\ x^2 + 7x = 2x \\ \boxed{-2x} \quad \boxed{-2x} \\ x^2 + 5x = 0 \\ x(x+5) = 0 \\ x=0 \text{ of } x+5=0 \\ x=0 \text{ of } x=-5 \end{array}$$

7 a Oppervlakte gras = $4x + x(x+12)$
 $= 4x + x^2 + 12x$
 $= x^2 + 16x$

b $x^2 + 16x = 80$

c

$$\begin{array}{l} \boxed{-80} \quad \boxed{-80} \\ x^2 + 16x - 80 = 0 \\ (x-4)(x+20) = 0 \\ x-4=0 \text{ of } x+20=0 \\ x=4 \text{ of } x=-20 \end{array}$$

d Een breedte kan niet negatief zijn, dus de breedte is 4 m.

8 a $x(x-2) = 8$
 $x^2 - 2x = 8$

$$\begin{array}{l} \boxed{-8} \quad \boxed{-8} \\ x^2 - 2x - 8 = 0 \\ (x+2)(x-4) = 0 \\ x+2=0 \text{ of } x-4=0 \\ x=-2 \text{ of } x=4 \end{array}$$

b $(x-1)(x+4) = 36$
 $x^2 + 4x - x - 4 = 36$
 $x^2 + 3x - 4 = 36$

$$\begin{array}{l} \boxed{-36} \quad \boxed{-36} \\ x^2 + 3x - 40 = 0 \\ (x-5)(x+8) = 0 \\ x-5=0 \text{ of } x+8=0 \\ x=5 \text{ of } x=-8 \end{array}$$

$$\begin{aligned} \text{c} \quad (x-5)^2 &= 16x \\ x^2 - 10x + 25 &= 16x \\ &\quad \boxed{-16x} \quad \boxed{-16x} \end{aligned}$$

$$\begin{aligned} x^2 - 26x + 25 &= 0 \\ (x-1)(x-25) &= 0 \\ x-1=0 \text{ of } x-25=0 \\ x=1 \quad \text{of } x=25 \end{aligned}$$

$$\begin{aligned} \text{d} \quad (x+5)(x+12) &= 78 \\ x^2 + 12x + 5x + 60 &= 78 \\ x^2 + 17x + 60 &= 78 \\ &\quad \boxed{-78} \quad \boxed{-78} \end{aligned}$$

$$\begin{aligned} x^2 + 17x - 18 &= 0 \\ (x-1)(x+18) &= 0 \\ x-1=0 \text{ of } x+18=0 \\ x=1 \quad \text{of } x=-18 \end{aligned}$$

$$\begin{aligned} \text{e} \quad 5x(x-8) &= 20 \\ 5x^2 - 40x &= 20x \\ &\quad \boxed{-20x} \quad \boxed{-20x} \end{aligned}$$

$$\begin{aligned} 5x^2 - 60x &= 0 \\ 5x(x-12) &= 0 \\ 5x=0 \text{ of } x-12=0 \\ x=0 \quad \text{of } x=12 \end{aligned}$$

$$\begin{aligned} \text{f} \quad (2x-7)(3x+15) &= 0 \\ 2x-7=0 \text{ of } 3x+15=0 \\ 2x=7 \quad \text{of } 3x=-15 \\ x=\frac{7}{2} \quad \text{of } x=-5 \end{aligned}$$

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9 a $6x^2 - 5 = 1$

$$\boxed{+5} \quad \boxed{+5}$$

$$6x^2 = 6$$

$$\boxed{:6} \quad \boxed{:6}$$

$$x^2 = 1$$

$$x=1 \text{ of } x=-1$$

b $x^2 - 13 = 0$

$$\boxed{+13} \quad \boxed{+13}$$

$$x^2 = 13$$

$$x = \sqrt{13} \approx 3,61 \text{ of } x = -\sqrt{13} \approx -3,61$$

c $5x^2 + 1 = 0$

$$\boxed{-1} \quad \boxed{-1}$$

$$5x^2 = -1$$

$$\boxed{:5} \quad \boxed{:5}$$

$$x = -0,2$$

geen oplossingen

d $0,25x^2 - 1 = 15$

$$\boxed{+1} \quad \boxed{+1}$$

$$0,25x^2 = 16$$

$$\boxed{:0,25} \quad \boxed{:0,25}$$

$$x^2 = 64$$

$$x=8 \text{ of } x=-8$$

e $25 - x^2 = 16$

$$\boxed{-25} \quad \boxed{-25}$$

$$-x^2 = -9$$

$$\boxed{: -1} \quad \boxed{: -1}$$

$$x^2 = 9$$

$$x=3 \text{ of } x=-3$$

f $5x^2 + 12 = 12$

$$\boxed{-12} \quad \boxed{-12}$$

$$5x^2 = 0$$

$$\boxed{:5} \quad \boxed{:5}$$

$$x^2 = 0$$

$$x = 0$$

10 a $2(x-3)^2 + 5 = 7$

$$\boxed{-5} \quad \boxed{-5}$$

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

$$\boxed{:2} \quad \boxed{:2}$$

$$(x-3)^2 = 1$$

$$x-3 = 1 \text{ of } x-3 = -1$$

$$x = 4 \quad \text{of } x = 2$$

b $\frac{1}{5}(x+1)^2 - 1 = 4$

$$\boxed{+1} \quad \boxed{+1}$$

$$\frac{1}{5}(x+1)^2 = 5$$

$$\boxed{\times 5} \quad \boxed{\times 5}$$

$$(x+1)^2 = 25$$

$$x+1 = 5 \text{ of } x+1 = -5$$

$$x = 4 \quad \text{of } x = -6$$

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

$$\boxed{-x} \quad \boxed{-x}$$

$$x^2 - x - 5 = -3$$

$$\boxed{+3} \quad \boxed{+3}$$

$$x^2 - x - 2 = 0$$

$$(x+1)(x-2) = 0$$

$$x+1 = 0 \text{ of } x-2 = 0$$

$$x = -1 \quad \text{of } x = 2$$

Bij $x = -1$ hoort $y = -1 - 3 = -4$, dus $A(-1, -4)$.

Bij $x = 2$ hoort $y = 2 - 3 = -1$, dus $B(2, -1)$.

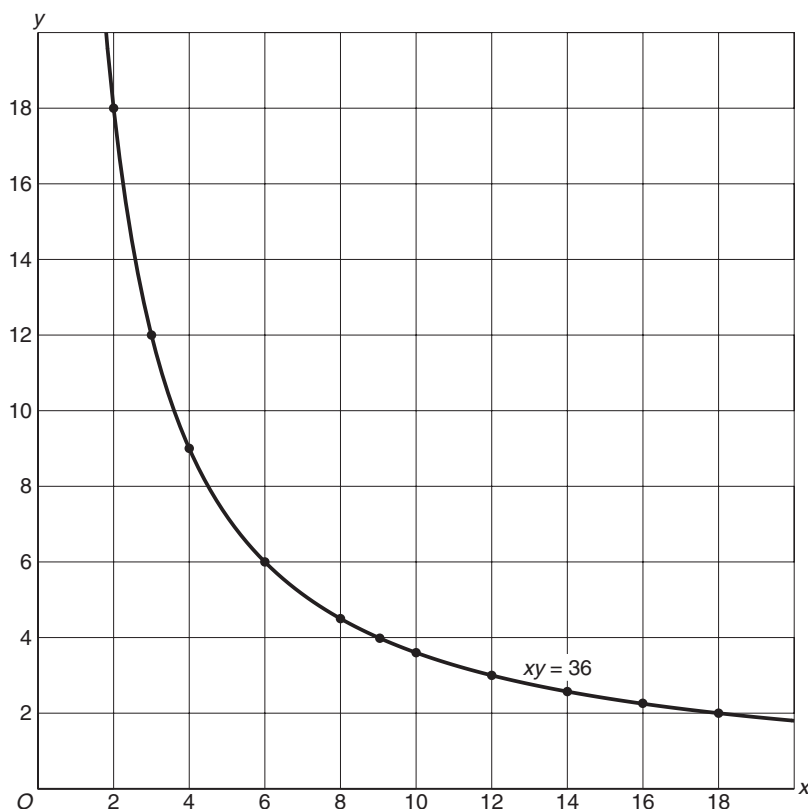
12 a $xy = 36$

$$x = \frac{36}{y}$$

$$y = \frac{36}{x}$$

b

x	2	3	4	6	8	9	10	12	18
y	18	12	9	6	4,5	4	3,6	3	2



c Als x heel klein is, dan is y heel groot.

Als x bijvoorbeeld 0,0001 is, dan is $y = 360\,000$

d Stel de breedte = x , dan is de lengte = $4x$

$$\text{opp (tuin)} = 4x \cdot x = 4x^2$$

$$4x^2 = 36$$

$$\boxed{: 4} \quad \boxed{: 4}$$

$$x^2 = 9$$

$$x = 3 \text{ of } x = -3$$

De tuin is $4 \cdot 3 = 12$ m lang en 4 m breed.

e Stel de breedte = x , dan is de lengte = $x + 9$

$$\text{opp (tuin)} = x(x + 9) = x^2 + 9x$$

$$x^2 + 9x = 36$$

$$\boxed{-36} \quad \boxed{-36}$$

$$x^2 + 9x - 36 = 0$$

$$(x - 3)(x + 12) = 0$$

$$x - 3 = 0 \text{ of } x + 12 = 0$$

$$x = 3 \text{ of } x = -12$$

De tuin is $3 + 9 = 12$ m lang en 3 m breed.