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Gr. 10

Totaal: 65  
Tyd: 1,5 uur

Kwartaal 1, Toets 1, 2026 – Memorandum

**VRAAG 1**

1.1 Skryf 'n rasionale getal tussen  $\sqrt{26}$  en  $\sqrt{37}$  neer. (1)

$$\sqrt{36} = 6 \checkmark$$

1.2 Bewys volledig dat  $2, \dot{1}3\dot{1}$  rasionaal is. (4)

$$x = 2,13113131 \dots (1) \checkmark$$

$$1000x = 2\,131,131131131 \dots (2) \checkmark$$

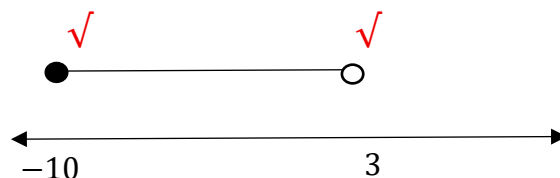
$$999x = 2129 (2)-(1) \checkmark$$

$$x = \frac{2129}{999} \checkmark$$

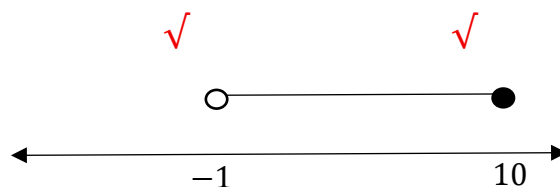
$2, \dot{1}3\dot{1}$  is rasionaal

1.3 Stel die volgende versameling van getalle op 'n getallelyn voor:

1.3.1  $x \in [-10; 3)$  (2)



1.3.2  $\{x: -1 < x \leq 10, x \in R\}$  (2)



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## VRAAG 2

Vereenvoudig volledig:

$$2.1 \quad -\frac{1}{3}(3x - 9y^2) \quad (1)$$

$$= -x + 3y^2 \checkmark$$

$$2.2 \quad (2x - 3y)^2 \quad (2)$$

$$= 4x^2 - 12xy \checkmark + 9y^2 \checkmark$$

$$2.3 \quad \left(\frac{1}{2x} - \frac{2}{y}\right)\left(\frac{1}{2x} + \frac{2}{y}\right) \quad (2)$$

$$= \frac{1}{4x^2} \checkmark - \frac{4}{y^2} \checkmark$$

$$2.4 \quad (2xy - 4z)(4x^2y^2 + 8xyz + 16z^2) - (xy - 2z)^2 \quad (4)$$

$$= 8x^3y^3 - 64z^3 - (x^2y^2 - 4xyz + 4z^2 \checkmark)$$

$$= 8x^3y^3 \checkmark - 64z^3 \checkmark - x^2y^2 + 4xyz - 4z^2 \checkmark$$

$$2.5 \quad (2a - b - 1)(1 + 2a - b) \quad (3)$$

$$= (2a - b - 1)(2a - b + 1)$$

$$= (2a - b)^2 - 1$$

$$= 4a^2 - 4ab \checkmark + b^2 \checkmark - 1 \checkmark$$

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## VRAAG 3

Faktoriseer volledig:

$$3.1 \quad x^2 + 11x + 30 \quad (2)$$

$$= (x + 6) \checkmark (x + 5) \checkmark$$

$$3.2 \quad a^3b^6 - \frac{1}{27} \quad (2)$$

$$= \left(ab^2 - \frac{1}{3}\right) \checkmark \left(a^2b^4 + \frac{ab^2}{3} + \frac{1}{9}\right) \checkmark$$

$$3.3 \quad 2a^{32} - 18 \quad (2)$$

$$= 2(a^{32} - 9)$$

$$= 2(a^{16} - 3) \checkmark (a^{16} + 3) \checkmark$$

$$3.4 \quad (3+x)^2 - (3-x)^2 \quad (3)$$

$$= [3+x - (3-x)][3+x + (3-x)]$$

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

$$= 2x(6)$$

$$= 12x$$

$$3.5 \quad a^2 - 4ab + 4b^2 - 64c^2 \quad (3)$$

$$= (a-2b)(a-2b) - 64c^2$$

$$= (a-2b)^2 - 64c^2$$

$$= (a-2b-8c)(a-2b+8c)$$

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#### VRAAG 4

Vereenvoudig:

$$4.1 \quad \frac{x^2+2x-8}{x-2} \div \frac{-x-4}{-4} \quad (4)$$

$$= \frac{(x-2)(x+4)}{x-2} \times \frac{-4}{-(x+4)}$$

$$= 4$$

$$4.2 \quad \frac{2x^2+8x}{4x^2} - \frac{4x-2}{3x} - 3 \quad (5)$$

$$= \frac{2x(x+4)}{4x^2} - \frac{4x-2}{3x} - 3$$

$$= \frac{(x+4)}{2x} - \frac{4x-2}{3x} - 3$$

$$= \frac{3(x+4) - 2(4x-2) - 3(6)}{6x}$$

$$= \frac{3x+12-8x+4-18}{6x}$$

$$= \frac{-5x-2}{6x}$$

$$4.3 \quad \left(\frac{2}{x+1} + 1\right)\left(2 - \frac{3}{2x+1}\right) \quad (5)$$

$$= \frac{4}{x+1} - \frac{6}{(x+1)(2x+1)} + 2 - \frac{3}{2x+1}$$

$$= \frac{4(2x+1) - 6 + 2(x+1)(2x+1) - 3(x+1)}{(x+1)(2x+1)}$$

$$= \frac{8x+4-6+2(2x^2+3x+1)-3x-3}{(x+1)(2x+1)}$$

$$= \frac{8x+4-6+4x^2+6x+2-3x-3}{(x+1)(2x+1)}$$

$$= \frac{4x^2+11x-3}{(x+1)(2x+1)}$$

$$4.4 \quad \frac{2x^2+4x}{-3x^2-x+2} \div \frac{4x^3}{12x^2+4x-8} \times \frac{x}{2x^2-8} \quad (6)$$

$$= -\frac{2x(x+2)\sqrt{\phantom{x}}}{(3x^2+x-2)\sqrt{\phantom{x}}} \div \frac{4x^3}{4(3x^2+x-2)} \times \frac{x}{2(x^2-4)}$$

$$= -\frac{2x(x+2)}{(3x-2)(x+1)} \div \frac{4x^3}{4(3x-2)(x+1)\sqrt{\phantom{x}}} \times \frac{x}{2(x+2)(x-2)\sqrt{\phantom{x}}}$$

$$= -\frac{2x(x+2)}{(3x-2)(x+1)} \times \frac{\sqrt{4(3x-2)(x+1)}}{4x^3} \times \frac{x}{2(x+2)(x-2)}$$

$$= -\frac{2}{x(x-2)} \sqrt{\phantom{x}}$$

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### VRAAG 5

Vereenvoudig volledig:

$$5.1 \quad \left(\frac{-2x^{-2}y^{-1}}{xy}\right)^{-3} \quad (4)$$

$$= \left(\frac{-2}{x^3y^2\sqrt{\phantom{x}}}\right)^{-3}$$

$$= \left(\frac{x^3y^2}{-2}\right)^3 \sqrt{\phantom{x}}$$

$$= \frac{x^9y^6\sqrt{\phantom{x}}}{-8\sqrt{\phantom{x}}}$$

$$5.2 \quad \frac{2^a+2^{a+2}}{2^{a-1}} \quad (3)$$

$$= \frac{2^a(1+2^2)\sqrt{\phantom{x}}}{2^a \cdot 2^{-1}}$$

$$= 5.2 \sqrt{\phantom{x}}$$

$$= 10 \sqrt{\phantom{x}}$$

$$5.3 \quad \frac{6^x \cdot 36^{x+3}}{2^{3x-1} \cdot 27^x} \quad (5)$$

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

$$= \frac{2^x \cdot 3^x \cdot \sqrt{2^{2x+6}} \cdot \sqrt{3^{2x+6}}}{2^{3x-1} \cdot 3^{3x}\sqrt{\phantom{x}}}$$

$$= 2^{x+2x+6-3x+1} \cdot 3^{x+2x+6-3x}$$

$$= 2^7 \sqrt{\phantom{x}} \cdot 3^6 \sqrt{\phantom{x}}$$

$$= 93312$$

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Totaal: [65]