



Besoek www.litnet.co.za vir gratis skole-inhoud.



Gr. 11

Totaal: 55

Tyd: $1\frac{1}{4}$ uur

Kwartaal 1, Toets 2, 2025 – Memorandum
Vergelykings, ongelykhede en getalpatrone

VRAAG 1

Los op vir x :

1.1 $x^2 = 4x$ (2)

$$x(x - 4) = 0 \checkmark$$

$$x = 0 \text{ of } x = 4 \checkmark \text{ beide oplossings}$$

1.2 $x - 1 = \frac{1}{x-1}$ (3)

$$(x - 1)^2 = 1 \checkmark$$

$$x - 1 = \pm 1$$

$$x = 2 \checkmark \text{ of } x = 0 \checkmark$$

1.3 $5x^2 - 7x = -1$ (korrek tot twee desimale syfers) (4)

$$5x^2 - 7x + 1 = 0 \checkmark$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(5)(1)}}{2(5)} \checkmark$$

$$x = \frac{6 \pm \sqrt{16}}{2(5)}$$

$$x = 1,24 \checkmark \text{ of } x = 0,16 \checkmark$$

1.4 $3^{2x-1} \cdot 36^{-x+1} = 48$ (4)

$$3^{2x-1} \cdot 2^{-2x+2} \cdot 3^{-2x+2} \checkmark = 48$$

$$3^1 \cdot 2^{-2x+2} = 48$$

$$2^{-2x+2} = 16$$

$$2^{-2x+2} = 2^4 \checkmark$$

$$-2x + 2 = 4 \checkmark$$

$$-2x = 2$$

$$x = -1 \checkmark$$

1.5 $2^{2x} - 5 = -\frac{4}{2^{2x}}$ (4)

$$2^{4x} - 5 \cdot 2^{2x} + 4 = 0 \checkmark$$

$$(2^{2x} - 4)(2^{2x} - 1) = 0 \checkmark$$

$$2^{2x} = 2^2 \text{ of } 2^{2x} = 1/2^0$$

$$2x = 2 \quad 2x = 0$$

$$x = 1 \checkmark \quad x = 0 \checkmark$$

$$1.6 \quad \frac{10}{3(x-3)} - \frac{x-1}{3-x} = -\frac{1}{3x} \quad (5)$$

$$\frac{10}{3(x-3)} + \frac{x-1}{x-3} \checkmark = -\frac{1}{3x}$$

$$10x + 3x(x-1) + (x-3) = 0 \checkmark \text{ maal KGV}$$

$$3x^2 + 8x - 3 = 0 \checkmark$$

$$(3x-1)(x+3) = 0 \checkmark$$

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

[22]

VRAAG 2

2.1 Los die volgende ongelykhede op:

$$2.1.1 \quad 4x(2x-1) \geq 0 \quad (2)$$

$$x \leq 0 \checkmark \cup x \geq \frac{1}{2} \checkmark$$

$$2.1.2 \quad -4x^2 + 17x > 4 \quad (4)$$

$$-4x^2 + 17x - 4 > 0$$

$$4x^2 - 17x + 4 < 0 \checkmark$$

$$(4x-1)(x-4) < 0 \checkmark$$

$$\frac{1}{4} < x < 4 \checkmark \text{ grense } \checkmark \text{ notasie}$$

2.2 Los vir x en y gelyktydig op:

$$x + 2y = 1 \quad \text{en} \quad 2y - 6x^2 + 2x = -6 \quad (7)$$

$$x = 1 - 2y \dots\dots(1) \checkmark$$

Stel (1) in:

$$2y - 6(1 - 2y)^2 + 2(1 - 2y) = -6 \checkmark \text{ substitusie}$$

$$2y - 6(1 - 4y + 4y^2) + 2 - 4y + 6 = 0$$

$$2y - 6 + 24y - 24y^2 + 2 - 4y + 6 = 0$$

$$0 = 24y^2 - 22y - 2$$

$$0 = 12y^2 - 11y - 1 \checkmark$$

$$0 = (12y+1)(y-1) \checkmark$$

$$y = -\frac{1}{12} \quad \text{of} \quad y = 1 \checkmark \text{ beide oplossings}$$

$$x = \frac{7}{6} \checkmark \quad x = -1 \checkmark$$

$$2.3 \quad \text{Gegee: } \frac{m}{2} + \frac{1}{m} = -\frac{3}{2}$$

$$2.3.1 \quad \text{Los op vir } m. \quad (4)$$

$$m^2 + 3m + 2 = 0 \checkmark$$

$$(m+2)(m+1) = 0 \checkmark$$

$$m = -2 \checkmark \quad \text{of} \quad m = -1 \checkmark$$

$$2.3.2 \quad \text{Vervolgens, of andersins, los op vir } x, \text{ indien: } \frac{\sqrt{x+2}-2x}{2} + \frac{1}{\sqrt{x+2}-2x} = -\frac{3}{2}. \quad (10)$$

$$\sqrt{x+2} - 2x = -2 \checkmark$$

$$(\sqrt{x+2})^2 = (2x-2)^2$$

$$x+2 = 4x^2 - 8x + 4 \checkmark$$

$$0 = 4x^2 - 9x + 2 \checkmark$$

$$0 = (4x-1)(x-2) \checkmark$$

$$x \neq \frac{1}{4} \quad \text{of} \quad x = 2 \checkmark$$

$$\sqrt{x+2} - 2x = -1 \checkmark$$

$$(\sqrt{x+2})^2 = (2x-1)^2$$

$$x+2 = 4x^2 - 4x + 1 \checkmark$$

$$0 = 4x^2 - 5x - 1 \checkmark$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(4)(-1)}}{2(4)} \checkmark$$

$$x = 1,43 \text{ en } x \neq -0,18 \checkmark$$

[27]

VRAAG 3

In 'n kwadratiese ry is die tweede term gelyk aan 2, die derde term gelyk aan 9 en die vyfde term gelyk aan 32.

3.1 Bereken die konstante tweede verskil van hierdie kwadratiese patroon. (4)

$$x; 2; 9; y; 32$$

$$1\text{ste verskille: } 2 - x; 7; y - 9; 32 - y \checkmark$$

$$2\text{de verskille: } 7 - (2 - x); y - 9 - 7; 32 - y - (y - 9)$$

$$y - 9 - 7 = 32 - y - (y - 9) \checkmark$$

$$y - 16 = 41 - 2y$$

$$3y = 57$$

$$y = 19 \checkmark$$

$$\text{Konstante 2de verskil: } 19 - 9 - 7 = 3 \checkmark$$

3.2 Vervolgens of andersins, bepaal die eerste term van hierdie patroon. (2)

$$7 - (2 - x) = 3 \checkmark$$

$$7 - 2 + x = 3$$

$$x = -2 \checkmark$$

[6]

Totaal: [55]