



Kwartaal 1 – Toets – Memorandum

Vraag 1

1.1 Beskou die volgende kwadratiese getalpatroon en beantwoord die vrae wat volg:

$$-3; 2; 9; 18; \dots$$

1.1.1 Bepaal die n -de term van die gegewe patroon. (4)

$$-3; 2; 9; 18; \dots$$

$$5 \quad 7 \quad 9$$

$$2 \quad 2$$

$$2a = 2$$

$$3(1) + b = 5$$

$$1 + 2 + c = -3$$

$$a = 1\checkmark$$

$$b = 2\checkmark$$

$$c = -6\checkmark$$

$$T_n = n^2 + 2n - 6\checkmark$$

1.1.2 Tussen watter twee opeenvolgende terme sal die eerste verskil van hierdie patroon gelyk wees aan 303? (3)

5 7 9 – 1ste verskille vorm 'n lineêre patroon

$$T_n = 2n + 3\checkmark$$

$$303 = 2n + 3\checkmark$$

$$300 = 2n$$

$$150 = n\checkmark$$

1.2 Die volgende getalpatroon het 'n konstante tweede verskil van 3.
Bepaal die waardes van x en y : (5)

$$-15; x; -6; y$$

$$1\text{ste Verskille} : x + 15; -6 - x; y + 6\checkmark$$

2de Verskille:

$$-6 - x - x - 15 = 3\checkmark$$

$$-2x = 24$$

$$x = -12\checkmark$$

$$y + 6 + 6 + (-12) = 3\checkmark$$

$$y = 3\checkmark$$

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Vraag 2

Vereenvoudig elkeen van die volgende sonder die gebruik van 'n sakrekenaar en los jou antwoord met positiewe eksponente:

$$2.1 \quad \frac{3^2 \cdot 3^{-1} + (-3)^0}{(\sqrt{16})^{\frac{1}{2}}} \quad (5)$$

$$\begin{aligned} &= \frac{3^{1\checkmark} + 1\checkmark}{(4)^{\frac{1}{2}\checkmark}} \\ &= \frac{4}{(4)^{\frac{1}{2}}} \\ &= 4^{\frac{1}{2}} \\ &= (2^2)^{\frac{1}{2}\checkmark} \\ &= 2\checkmark \end{aligned}$$

$$2.2 \quad \frac{3\sqrt{20x^3} - x\sqrt{45x}}{\sqrt{80x^5}} \quad (5)$$

$$\begin{aligned} &= \frac{3\sqrt{4 \cdot 5 \cdot x^2 \cdot x} - x\sqrt{9 \cdot 5x}}{\sqrt{16 \cdot 5x^4 \cdot x}} \\ &= \frac{3 \cdot 2x\sqrt{5x}\checkmark - 3x\sqrt{5x}\checkmark}{4x^2\sqrt{5x}\checkmark} \\ &= \frac{3x\sqrt{5x}\checkmark}{4x^2\sqrt{5x}} \\ &= \frac{3}{4x}\checkmark \end{aligned}$$

$$2.3 \quad \frac{4^x \cdot 16^{x-2} \cdot \sqrt{2}}{8^x \cdot 32^{x-1} \cdot 2^{-2x-2.5}} \quad (5)$$

$$\begin{aligned} &= \frac{(2^2)^x \cdot (2^4)^{x-2} \cdot 2^{0.5}\checkmark}{(2^3)^x \cdot (2^5)^{x-1} \cdot 2^{-2x-2.5}} \\ &= \frac{2^{2x} \cdot 2^{4x-8} \cdot 2^{0.5}\checkmark \text{teller}}{2^{3x} \cdot 2^{5x-5} \cdot 2^{-2x-2.5}\checkmark \text{noemer}} \\ &= 2^{2x+4x-8+0.5-3x-5x+5+2x+2.5}\checkmark \\ &= 2^0 \\ &= 1\checkmark \end{aligned}$$

$$2.4 \quad \frac{2^{2022} - 2^{2019}}{2^{2017} \cdot 2.2} \quad (3)$$

$$\begin{aligned} &= \frac{2^{2019}(2^3 - 1)\checkmark}{2^{2019}\checkmark} \\ &= 7\checkmark \end{aligned}$$

Vraag 3

Los op vir x :

3.1 $3 \cdot 2^x + 2^{x+2} = 56$ (3)

$$\begin{aligned}2^x(3 + 2^2) &= 56 \checkmark \\2^x(7) &= 56 \\2^x &= 8 \checkmark \\2^x &= 2^3 \\x &= 3 \checkmark\end{aligned}$$

3.2 $5^x - 26 + \frac{25}{5^x} = 0$ (4)

$$\begin{aligned}5^{2x} - 26 \cdot 5^x + 25 &= 0 \checkmark \\(5^x - 1)(5^x - 25) &= 0 \checkmark \\5^x - 1 &= 0 & \text{of} & 5^x - 25 = 0 \\5^x &= 1 & & 5^x = 25 \\5^x &= 5^0 & & 5^x = 5^2 \\x &= 0 \checkmark & & x = 2 \checkmark\end{aligned}$$

$$\begin{aligned}x^2 - 4x - 10 &= 0 \checkmark \\x &= \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(-10)}}{2(1)} \checkmark \\x &= \frac{4 \pm \sqrt{56}}{2} \\x &= -1,74 \checkmark \text{ en } x = 5,74 \checkmark\end{aligned}$$

3.3 $x^2 - 4x = 10$ (4)

3.4 $3x^{\frac{2}{3}} = 12$ (3)

$$\begin{aligned}x^{\frac{2}{3}} &= 4 \checkmark \\(x^{\frac{2}{3}})^{\frac{3}{2}} &= \pm(2^2)^{\frac{3}{2}} \checkmark \\x &= \pm 8 \checkmark\end{aligned}$$

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Vraag 4

4.1 Bespreek die aard van die wortels van die volgende kwadratiese vergelyking sonder om x op te los: (5)

$$2x^2 = -3x + 4$$

$$\begin{aligned}2x^2 + 3x - 4 &= 0 \checkmark \\ \Delta &= 3^2 - 4(2)(-4) \checkmark \\ \Delta &= 3^2 - 4(2)(-4) \\ \Delta &= 41 \checkmark\end{aligned}$$

∴ Wortels is Reëel, Irrasionaal✓ en Ongelyk✓

4.2 Bepaal die waarde(s) van p , waarvoor $2px^2 - px + 3x = 2$, gelyke wortels sal hê. (6)

$$2px^2 + (-p + 3)x - 2 = 0✓$$

Vir gelyke wortels is $\Delta = 0$

$$(-p + 3)^2 - 4(2p)(-2) = 0✓$$

$$p^2 - 6p + 9 + 16p = 0$$

$$p^2 + 10p + 9 = 0✓$$

$$(p + 1)(p + 9) = 0✓$$

$$p = -1✓ \text{ of } p = -9✓$$

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TOTAAL: [55]