



Kwartaal 4, November Vraestel 1, 2023 – Memorandum

Vraag 11.1 Toon aan dat $4,34\dot{2}$ rasionaal is. (4)

$$x = 4,342222222 \dots \dots (1)$$

$$100x = 434,2222222 \dots \dots (2) \checkmark$$

$$1000x = 4342,222222 \dots \dots (3) \checkmark$$

$$(3) - (2): 900x = 3908 \checkmark$$

$$x = \frac{977}{225} \checkmark$$

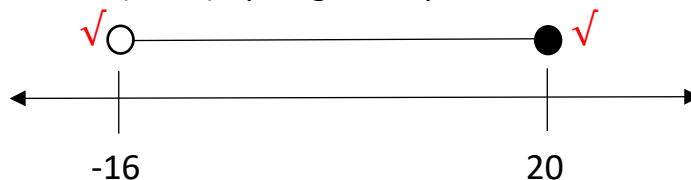
 $\therefore x$ is Q 1.2.1 Los op vir x :

$$-3 \leq 2 - \frac{3x}{4} < 6 \quad (3)$$

$$-5 \leq -\frac{x}{4} < 4 \checkmark$$

$$20 \geq x > -16 \checkmark$$

1.2.2 Stel jou antwoord in (1.2.1) op 'n getallelyn voor. (2)



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Vraag 2

Vereenvoudig volledig:

2.1 $-x(x+1)(x^2-x+1)$ (2)

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

$$= -x^4 - x \checkmark$$

2.2 $(y - \frac{2x}{y})(2y + \frac{x}{y})$ (3)

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

$$= 2y^2 \checkmark - 3x \checkmark - \frac{2x^2}{y^2} \checkmark$$

$$2.3 \quad \frac{125^{3x-1} \cdot 9 \cdot 25^x}{\sqrt[3]{276x-3} \cdot \frac{1}{5}} \quad (5)$$

$$= \frac{(5^3)^{3x-1} \cdot 3^2 \cdot (5^2)^x}{3^{2x-1} \cdot 5^{-1}}$$

$$= \frac{5^{9x-3} \cdot 3^2 \cdot 5^{2x} \sqrt{}}{3^{2x-1} \cdot \sqrt{5} \cdot 5^{-1} \sqrt{}}$$

$$= 5^{9x-3+2x-(-1)} \cdot 3^{2-(2x-1)}$$

$$= 5^{9x-3+2x+1} \cdot 3^{2-2x+1}$$

$$= 5^{11x-2} \cdot \sqrt{3} \cdot 3^{-2x+3} \sqrt{}$$

$$2.4 \quad \frac{3^x + 3^{x+3}}{4(3^{-x})^{-1}} \quad (3)$$

$$= \frac{3^x(1+3^3) \sqrt{}}{4 \cdot 3^x \sqrt{}}$$

$$= \frac{(28)}{4}$$

$$= 7 \sqrt{}$$

$$2.5 \quad \text{Bepaal die waarde van } 3^x 5^x + 2(3^x 5^x) + 3(3^x 5^x), \text{ indien } \left(\frac{9}{25^{-1}}\right)^x = 225. \quad (6)$$

$$3^{2x} \sqrt{5} \cdot 5^{2x} \sqrt{5} = 3^2 \cdot 5^2 \sqrt{}$$

$$(3^2 \cdot 5^2)^x = 3^2 \cdot 5^2$$

$$x = 1 \sqrt{}$$

$$3^x 5^x + 2(3^x 5^x) + 3(3^x 5^x) = 15 + 2(15) + 3(15) \sqrt{5} = 90 \sqrt{5}$$

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Vraag 3

3.1 Faktoriseer volledig:

$$3.1.1 \quad 4x^{16} - \frac{1}{9} \quad (1)$$

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

$$3.1.2 \quad x^3 - 8 \quad (2)$$

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

$$3.1.3 \quad 25x^2 - 4y^2 - 2y - 5x \quad (3)$$

$$= (5x - 2y)(5x + 2y) \sqrt{5} - (5x + 2y) \sqrt{5}$$

$$= (5x + 2y)(5x - 2y - 1) \sqrt{5}$$

$$3.1.4 \quad 6y^2 + 24y - 30 \quad (3)$$

$$6(y^2 + 4y - 5)\checkmark$$

$$6(y - 1)\checkmark(y + 5)\checkmark$$

3.2 Vereenvoudig volledig:

$$3.2.1 \quad \frac{x^2+3x-10}{2x^2-4x} \quad (3)$$

$$= \frac{(x-2)(x+5)\checkmark}{2x(x-2)\checkmark}$$

$$= \frac{x+5}{2x}\checkmark$$

$$3.2.2 \quad \frac{-x^2+49}{2x^2+12x-14} \div \frac{1}{(x-1)(x-7)^{-1}} \quad (5)$$

$$= \frac{-(x^2-49)\checkmark}{2(x^2+6x-7)} \div \frac{(x-7)}{(x-1)}$$

$$= \frac{-(x-7)(x+7)\checkmark}{2(x+7)(x-1)\checkmark} \times \frac{(x-1)}{(x-7)}\checkmark$$

$$= -\frac{1}{2}\checkmark$$

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Vraag 4

Los op vir x :

$$4.1 \quad 3x^2 + 15x + 1 = 109 \quad (4)$$

$$3x^2 + 15x - 108 = 0\checkmark$$

$$3(x^2 + 5x - 36) = 0$$

$$3(x + 9)(x - 4) = 0\checkmark$$

$$x + 9 = 0 \text{ of } x - 4 = 0$$

$$x = -9\checkmark \text{ of } x = 4\checkmark$$

$$4.2 \quad \frac{a}{3x} + \frac{b}{2x} = ab \quad (3)$$

$$2a + 3b\checkmark = 6abx\checkmark$$

$$x = \frac{1}{3b} + \frac{1}{2a}\checkmark$$

$$4.3 \quad 3^{x-2} = 3.243^x \quad (3)$$

$$3^{x-2} = 3^{5x+1}\checkmark$$

$$x - 2 = 5x + 1\checkmark$$

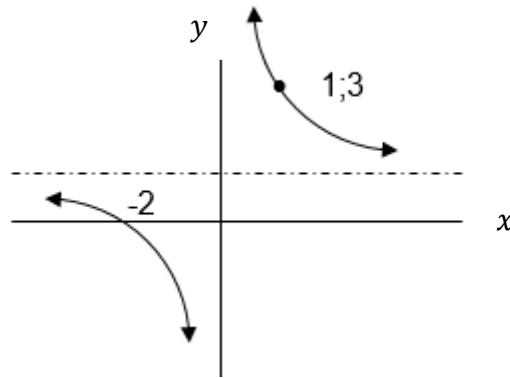
$$-4x = 3$$

$$x = -\frac{3}{4}\checkmark$$

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Vraag 5

5.1 Beskou die onderstaande funksie en beantwoord die vrae wat volg:



5.1.1 Bepaal die vergelyking van die funksie in die vorm $h(x) = \frac{a}{x} + q$. (4)

$$h(x) = \frac{a}{x} + q$$

Stel in (1; 3)

$$3 = a + q \dots\dots (1) \checkmark$$

Stel in (-2; 0)

$$0 = \frac{a}{-2} + q \dots\dots (2)$$

$$a = 2q \checkmark$$

Stel (2) in (1):

$$3 = 2q + q$$

$$3 = 3q$$

$$1 = q \checkmark$$

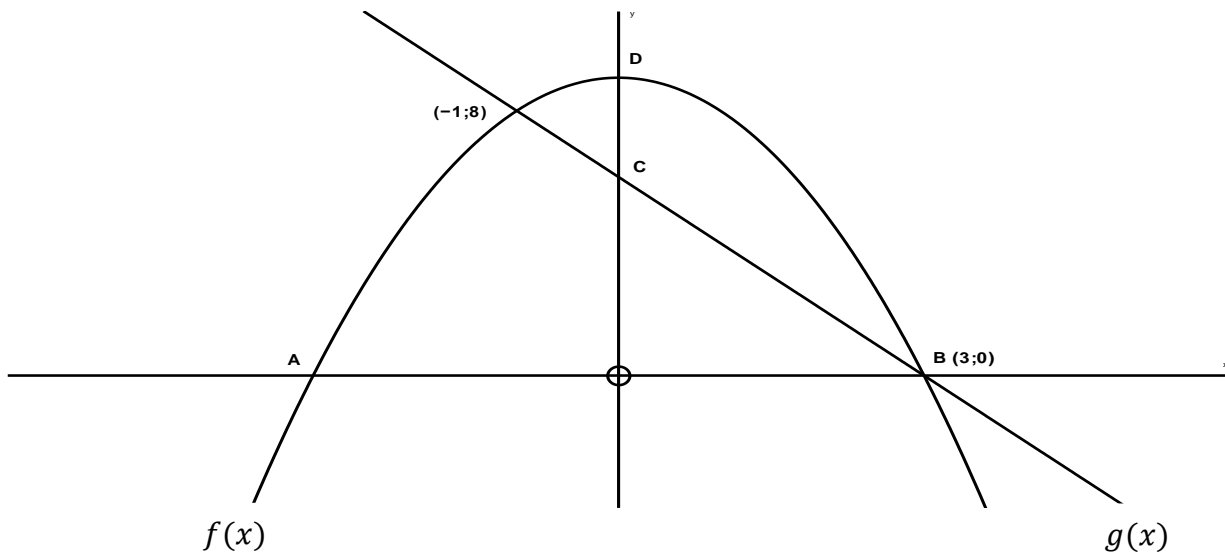
$$a = 2(1) = 2$$

$$h(x) = \frac{2}{x} + 1 \checkmark$$

5.1.2 Skryf die definisieversameling van h neer. (2)

$$x \in \mathbb{R} \checkmark; x \neq 0 \checkmark$$

5.2 Beskou die volgende grafiek: $f(x) = ax^2 + q$



5.2.1 Bepaal die vergelyking van die parabool.

(6)

Stel in (-1; 8)

$$8 = a(-1)^2 + q \checkmark$$

$$8 = a + q \dots\dots(1) \checkmark$$

Stel in (3; 0)

$$0 = a(3)^2 + q \checkmark$$

$$0 = 9a + q$$

$$q = -9a \dots\dots(2) \checkmark$$

Stel (2) in (1):

$$8 = a - 9a$$

$$8 = -8a$$

$$-1 = a \checkmark$$

$$q = -9(-1) = 9$$

$$f(x) = -x^2 + 9 \checkmark$$

5.2.2 Bepaal die waardes van x waarvoor :

5.2.2.1 $f(x) = g(x)$

(2)

$$x = -1 \checkmark \cup x = 3 \checkmark$$

5.2.2.2 $f(x) = 0$

(1)

$$x = \pm 3 \checkmark$$

5.2.2.3 $f(x) > 0$

(2)

$$-3 < x < 3 \checkmark \text{grense } \checkmark \text{notasie}$$

Vraag 6

6.1 As die wisselkoers 120 Jen = R11,50 en 1 AUD = R12,75 is, bepaal die wisselkoers tussen die Australiese dollar en die Japannese Jen. (3)

$$120 \text{ Jen} = R11,50 \qquad 1 \text{ AUD} = R12,75 \qquad 10,43 \text{ Jen} = 0,08 \text{ AUD}$$

$$10,43 \text{ Jen} = R1\checkmark \qquad 0,08 \text{ AUD} = R1\checkmark \qquad 130,38 \text{ Jen} = 1 \text{ AUD}\checkmark$$

6.2 Met Paul se geboorte het sy ma R5 550 belê. Op sy 18de verjaardag betaal die bank R27 582,75 aan hom uit. Wat was die bank se saamgestelde rentekoers per jaar? (3)

$$27582,75 = 5550(1 + i)^{18} \checkmark \text{formule } \checkmark \text{substitusie}$$

$$\left(\sqrt[18]{\frac{27582,75}{5550}} - 1 \right) \times 100 = r$$

$$r = 9,32\% \checkmark$$

6.3 Die volgende items word op 'n huurkoopvooreenkompsplan gekoop:

Stoof: R15 800

Yskas: R9 500

Tuimeldroër: R3 850

Die rekening moet binne 36 maande vereffen wees. 'n 12% deposito word vereis en enkelvoudige rente van 15,5% p.j. word op die uitstaande saldo gehêf.

'n Versekeringspremie van R35 per maand word ook verhaal.

Bereken die maandelikse paaiement. (5)

Totaal: R29 150

$$\text{Uitstaande saldo: } 29\,150 - (29\,150 \times 0,12) = R25\,652 \checkmark$$

$$A = 25\,652 \left(1 + \frac{15,5}{100} \times 3 \right) \checkmark \text{formule } \checkmark \text{substitusie}$$

$$A = R37\,580,18 \checkmark$$

$$\text{Premie per maand} = \frac{37580,18}{12} + 35 = R3\,166,68 \text{ p.m. } \checkmark$$

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Vraag 7

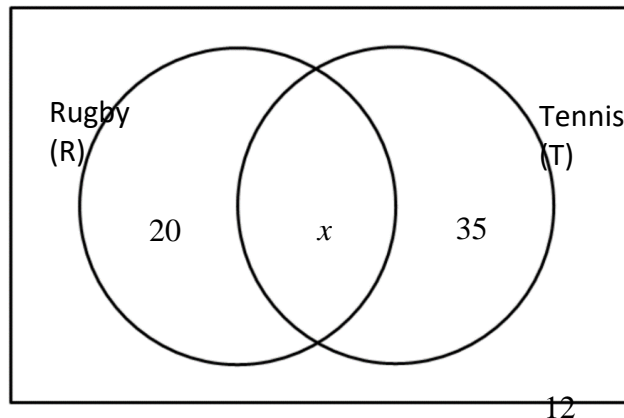
- 7.1 A en B is twee verskillende gebeurtenisse sodanig dat $P(A) = \frac{1}{3}$, $P(B) = 4P(A)$ en $P(A \text{ of } B) = \frac{3}{7}$.
Bereken $P(A \text{ en } B)$. (3)

$$P(A \text{ of } B) = P(A) + P(B) - P(A \text{ en } B) \checkmark$$

$$\frac{3}{7} = \frac{1}{3} + 4\left(\frac{1}{3}\right) - P(A \text{ en } B) \checkmark$$

$$P(A \text{ en } B) = \frac{26}{21} \checkmark$$

- 7.2 Die onderstaande Venn-diagram toon die sportvoorkeure van 105 graad 10-seuns aan.



- 7.2.1 Bereken die waarde van x . (2)

$$105 = 20 + 35 + 12 + x \checkmark$$

$$x = 38 \checkmark$$

- 7.2.2 Bereken die waarskynlikheid dat 'n seun wat willekeurig gekies word:

- 7.2.2.1 slegs rugby sal speel. (2)

$$P(\text{slegs } R) = \frac{20}{105} \checkmark = \frac{4}{21} \checkmark$$

- 7.2.2.2 rugby of tennis sal speel. (2)

$$P(R \text{ of } T) = \frac{93}{105} \checkmark = \frac{31}{35} \checkmark$$

- 7.2.2.3 nie rugby en tennis sal speel nie. (2)

$$P(R \text{ en } T)' = \frac{67}{105} \checkmark$$

- 7.2.3 Bereken $n(R' \cup T')$. (1)

$$n(R' \cup T') = 67 \checkmark$$

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Totaal: [95]