MEMORANDUM VRAESTEL 1

WISKUNDE GRAAD 10 TOTAAL: 100 PUNTE

INSTRUKSIES

1. Die memorandum dien om moontlike oplossings vir die probleme in die vraestel duidelik te maak aan die leerders. Leerders moet bewus wees dat die meeste probleme talle moontlike oplossingsmetodes het en nie net dié in die memorandum nie.

VRAAG 1

1.1

a) Reël, rasionaal, heelgetal, telgetal en natuurlike getal.
b) Reël en rasionaal
c) Nie-reël

1.2

Stel $x = 0{,}99999\ldots$

$10x = 9{,}999999$

$10x = 9{,}9999\ldots$

$-x = 0{,}9999\ldots$

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$9x = 9$

$x = 1$

1.3

a) $-p(-q-r)$

$= qp + rp$

b) $(x+y)(2x-y)^2$

$= (x+y)(4x^2 - 4xy + y^2)$

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

c) $\frac{16^{x+1} - 4^{2x}}{2^0 - 2^1} \div \frac{-(2^{-2}.\ 4)}{(4^{-x})^2}$

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

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

$= \frac{\cancel{2^{4x}}(16-1)}{-1} \times \frac{1}{-1.\cancel{2^{4x}}}$

$= 16 - 1$

$= 15$

1.4

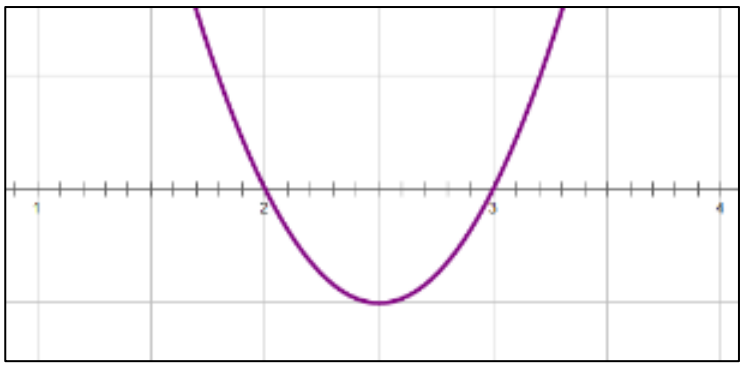
a) $x^2 - 4x + 23 > -x^2 + 6x + 11$

$2x^2 - 10x + 12 > 0$

$(2x-6)(x-2) > 0$

Kritieke waardes: $x = \frac{6}{2} = 3$ of $x = 2$

$x < 2\ of\ x > 3$



b) $\frac{(x-4)(x+2)}{x^3+8}+\frac{1}{-3x+12}=0$

$$\frac{\cancel{(x-4)(x+2)}}{\cancel{(x+2)}(x^2-2x+4)}+\frac{1}{-3\cancel{(x-4)}}=0$$

$$\frac{1}{(x^2-2x+4)}+\frac{1}{-3}=0$$

$$\frac{-3+x^2-2x+4}{-3(x^2-2x+4)}=0$$

$$-3+x^2-2x+4=0$$

$$x^2-2x+1=0$$

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

$$x=1$$

c) $ax^2+bx+c=0$

$$ax^2+bx=-c$$

$$x(ax+b)=-c$$

$$ax+b=\frac{-c}{x}$$

$$b=\frac{-c}{x}-ax$$

d) $(\frac{1}{4})^{-x}.16^{2x-1}=64$

$$4^x.4^{4x-2}=4^3$$

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

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

$$5x=5$$

$$x=1$$

1.5 $l = 2b$….(1)

$2l + 2b = 360$… (2)

Sub (1) in (2)

$2(2b) + 2b = 360$

$4b + 2b = 360$

$6b = 360$

$b = 60$…(3)

Sub (3) in (1)

$l = 2(60)$

$l = 120$

Die dimensies van die veld is 120 m x 60 m

VRAAG 2

2.1 12

2.2 $Tn = n$

2.3

a) 10

b) 1 ; 3 ; 6 ; 10 ; 15 ; 21 ; 28 ; 36

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2 3 4 5 6 7 8

$T_8 = 36$

2.4 $Tn = n^2 - n$ (deur inspeksie)

2.5

a) 9

b) 10

c) 16

d) 10 + 15 = 25

2.6 Vierkantsgetalle

VRAAG 3

3.1 $\text{EUR } 138{,}40 \times 16{,}47 = \text{R}2279{,}45$

3.2 Inflasie beteken die prys styg na: $138{,}40(1 + 0{,}022 \times 3) = \text{EUR}147{,}5344$

$\text{EUR}147{,}53 \times 16{,}47 = \text{R}2429{,}89$

3.3 $A = P(1 + i)^n$

$2429{,}89 = P(1 + \frac{0{,}075}{12})^{36}$

$\frac{2429{,}89}{(1 + \frac{0{,}075}{12})^{36}} = P$

$\text{R}1941{,}67 = \text{P}$

3.4 $\frac{15}{100} \times \text{ R}1941{,}67 = \text{R}291{,}25$

3.5 Ja, want die rand is nou sterker. Dit impliseer dat die 'snowboard' nou minder in rand sal kos as wat hy voorheen beplan het.

VRAAG 4

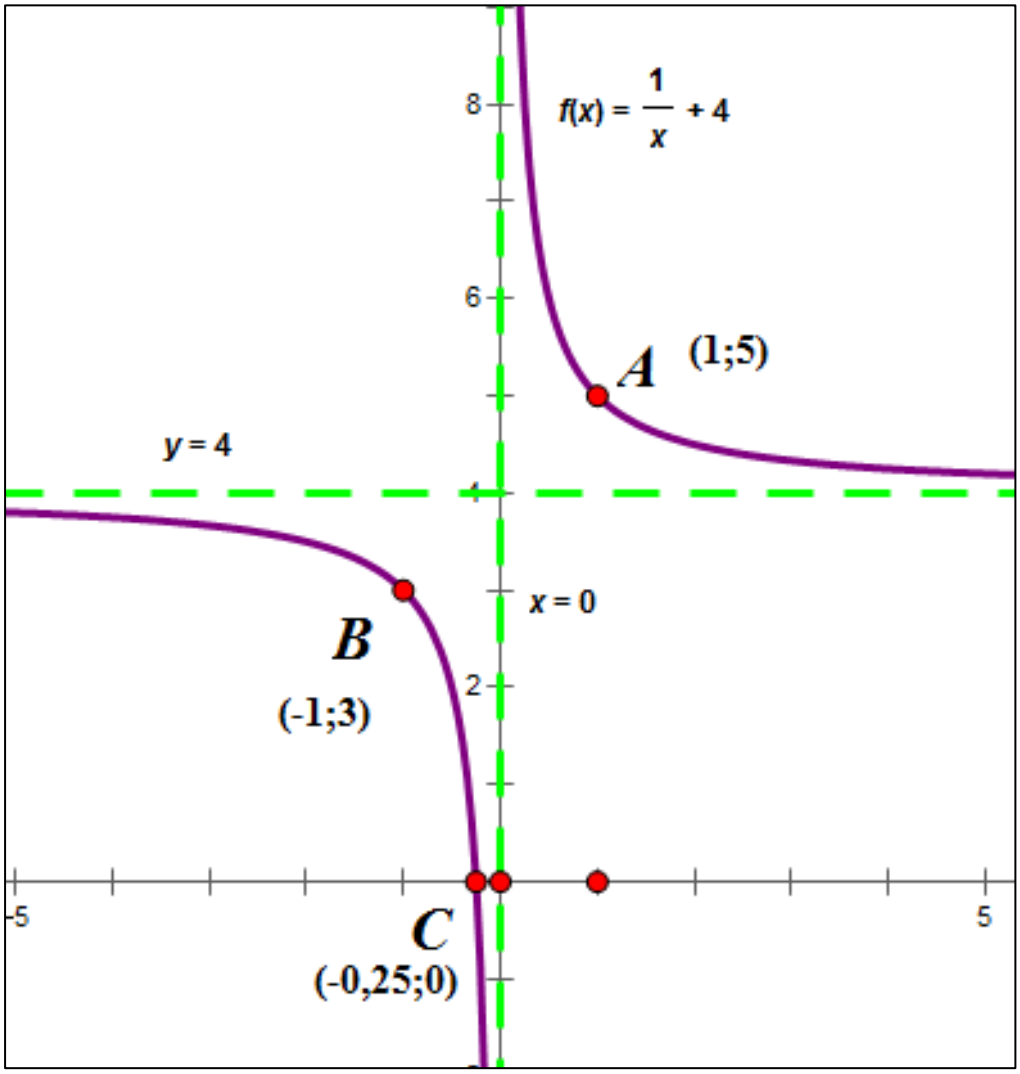
4.1

A – 1

B – 4

C – 2

4.2



4.3

a) $g(a) = -a^2 + 16$

b)$h(9) = \frac{2}{9-1} = \frac{2}{8} = 4$

c)$f(0) = \ 3^0 - 2 = 1 - 2 = -1$

d) $-x^2 + 16 = 0$

$x^2 - 16 = 0$

$(x - 4)(x + 4) = 0$

$x - 4 = 0 \ of \ x + 4 = 0$

$x = 4 \ of \ x = -4$

X-afsnitte: (-4 ; 0) en (4 ; 0)

4.4

a) $x \in R$

b) Die definisieversameling van ’n funksie dui al die waardes van x aan waar die funksie bestaan.

c) $y \in R \ [2; \infty)$

d) Die waardeversameling van 'n funksie dui al die waardes van y aan waar die funksie bestaan.

4.5

$y = ax^2 + q$

$q = 7$ en

$y = ax^2 + 7$

Stel in 'n bekende punt $(-1{,}5; 0)$ om a te breken

$0 = a(-1{,}5)^2 + 7$

$0 = a + 7$

$-7 = a$

$y = -7x^2 + 7$

VRAAG 5

5.1.1 $175 + 25 + 20 + 200 = 420$

5.1.2 $P(M) = \frac{200}{420} = \frac{10}{21}$

5.1.3 $P(S \cap A') = \frac{200}{420} = \frac{10}{21}$

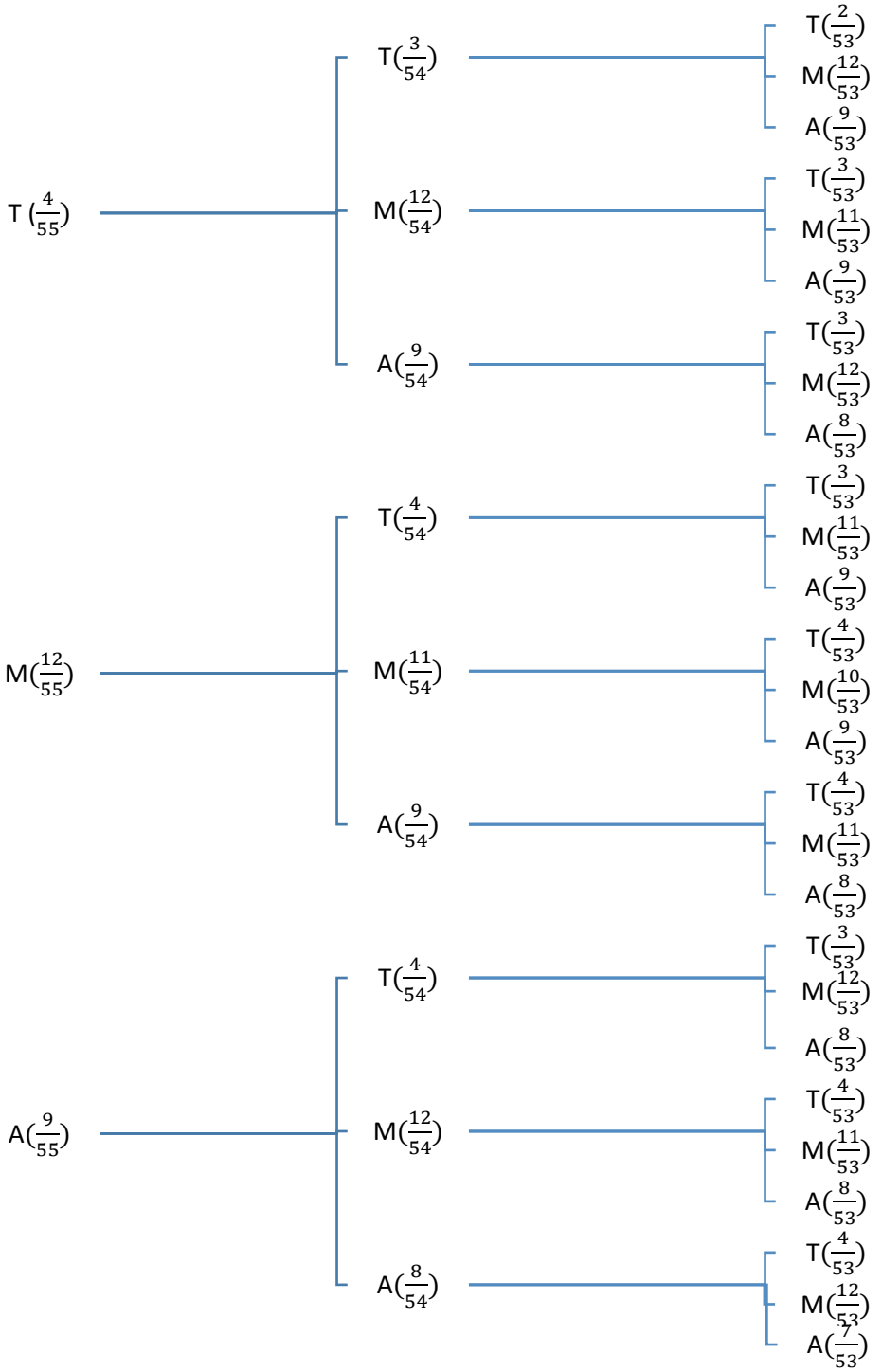
5.1.4 $P(M' \cap A) = \frac{20}{420} = \frac{1}{21}$

5.1.5 Nee, want daar is 'n snyding tussen "Meisies" en "Atletiek", wat beteken mens kan beide 'n meisie wees en in die atletiekspan wees.

5.2.1 $P(Tariena) = \frac{4}{55}$

5.2.2 $P(Arnold') = \frac{54-9}{54} = \frac{45}{54} = \frac{5}{6}$

5.2.3



Verwysings:

E-Classroom. (2017). Grade10: Mathematics Worksheets.

Laridon, P., J, A., Barnes, H., Cronjé, F., Karam, R., Kitto, A., … Wilson, H. (2008). *Classroom Mathematics Grade 10 Practice Book NCS*. Sandton: Heinemann Publihsers.