basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

GRADE/*GRAAD* 10

MATHEMATICS P1/*WISKUNDE V1*

NOVEMBER 2017

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 100

These marking guidelines consist of 12 pages.
Hierdie nasienriglyne bestaan uit 12 bladsye.

NOTE:
- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

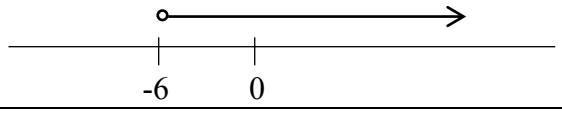
LET WEL:
- *As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.*
- *Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.*
- *Dit is onaanvaarbaar dat waardes/antwoorde veronderstel word om 'n probleem op te los.*

QUESTION/*VRAAG* 1

1.1.1	$q = \sqrt{b^2 - 4ac}$ $q = \sqrt{(-1)^2 - 4(2 \times -4)}$ $q = \sqrt{33}$	✓subst./*verv.* ✓answ/*antw* (2)
1.1.2	Irrational/*Irrasioneel*	✓answ/*antw* (1)
1.1.3	5 and/*en* 6	✓answ/*antw* (1)
1.2.1	$t^2(r-s) - r + s$ $= t^2(r-s) - (r-s)$ $= (r-s)(t^2-1)$ $= (r-s)(t-1)(t+1)$	✓grouping/*groepering* ✓factors/*faktore* ✓difference of two squares/*verskil van twee kwadrate* (3)
1.2.2	$\frac{x^3+1}{x^2-x+1}$ $= \frac{(x+1)(x^2-x+1)}{x^2-x+1}$ $= x+1$	✓factors/*faktore* ✓answ/*antw* (2)

1.3.1	$(2y+3)(7y^2-6y-8)$ $=14y^3-12y^2-16y+21y^2-18y-24$ $=14y^3+9y^2-34y-24$	✓simpl./*vereenv* ✓answ/*antw* (2)
1.3.2	$\frac{3}{x^2-9}+\frac{2}{(x-3)^2}$ $=\frac{3}{(x-3)(x+3)}+\frac{2}{(x-3)^2}$ $=\frac{3(x-3)+2(x+3)}{(x-3)^2(x+3)}$ $=\frac{3x-9+2x+6}{(x-3)^2(x+3)}$ $=\frac{5x-3}{(x-3)^2(x+3)}$	✓LCD/*KGN* ✓simpl./*vereenv* ✓answ/*antw* (3)
1.3.3	$\frac{3^t-3^{t-2}}{2.3^t-3^t}$ $=\frac{3^t(1-3^{-2})}{3^t(2-1)}$ $=\frac{1-\frac{1}{9}}{1}$ $=\frac{8}{9}$	✓factors/*faktore* ✓ simpl./*vereenv* ✓answ/*antw* (3)
		[17]

QUESTION/*VRAAG* 2

2.1.1	$4-2x<16$ $-2x<12$ $x>-6$	✓ simpl./*vereenv* ✓answ/*antw* (2)
2.1.2	 	✓ answ/*antw* (1)
2.2	$3x-4y=-4$.....(1) $-2x-y=10$.....(2) $3x-4y=-4$.....(1) $(2)\times -4: 8x+4y=-40$.....(3) $(1)+(3): 11x=-44$ $x=-4$ substitute $x=-4$ into (2) $-2(-4)-y=10$ $y=-2$ **OR** From(2): $y=-2x-10$.....(3) subst. (3) into (1): $3x-4(-2x-10)=-4$ $3x+8x+40=-4$ $11x=-44$ $x=-4$ subst. $x=-4$ into (3): $y=-2(-4)-10$ $y=-2$	✓multipl/*maal* (2) by/*met* 4 ✓adding/*tel op* (1) & (3) ✓*x*-value/*waarde* ✓*y*-value/*waarde* (4) ✓equation/*verg* (3) ✓ subst./*verv.* ✓*x*-value/*waarde* ✓*y*-value/*waarde* (4)
2.3.1	$\frac{x(x-5)}{6}-1=0$ $x^2-5x-6=0$ $(x-6)(x+1)=0$ $x=6$ or $x=-1$	✓stand. form/-*vorm* ✓factors/*faktore* ✓ answ/*antw* (3)
2.3.2	$c=\sqrt{a+2x}$ $c^2=a+2x$ $2x=c^2-a$ $x=\frac{c^2-a}{2}$	✓squaring/*kwadrering* ✓ answ/*antw* (2)

2.4	Let Linda's age now be *x/Laat Linda se ouderdom nou x wees* Therefore Tabelo's age is 4*x*/*Dus is Tabelo se ouderdom 4x* 6 years/*jaar* later: Linda's age will be:/ *Linda se ouderdom sal wees:* $x + 6$ Tabelo's age will be:/ *Tabelo se ouderdom sal wees:* $4x + 6$ $4x + 6 = 3(x + 6)$ $4x - 3x = 18 - 6$ $x = 12$ Linda's age/*Linda se ouderdom* is 12 years/*jaar*	✓$4x$ ✓$x + 6$ ✓equating/*verg.* ✓ answ/*antw* (4)
		[16]

QUESTION/*VRAAG* 3

3.1.1	$b = 14$	✓✓ answ/*antw* (2)
3.1.2	The sequence is linear/*Hierdie ry is lineêr*: $T_n = pn + q$. $T_n = 3n + q$ $T_n = 3n + 2$	✓3n ✓2 (2)
3.1.3	$T_n = 3n + 2$ $T_{15} = 3(15) + 2$ $T_{15} = 47$	✓ subst./*verv.* ✓ answ/*antw* (2)
3.1.4	$T_n = 3n + 2$ $83 = 3n + 2$ $3n = 81$ $n = 27$	✓ $T_n = 83$ ✓ answ/*antw* (2)
3.2.1	Sum of the terms in rows/*Som van terme in ry*: 2 ; 16 ; 54 ; 128 ;……. Row/*Ry* 1: 2 x 1= 2 Row/*Ry* 2 : 2 x 8 = 16 Row/*Ry* 3 : 2 x 27 = 54 Row/*Ry* 4 : 2 x 64 = 128 . . Row/*Ry n :* $2n^3$ Row/*Ry* 8 = $2(8)^3 = 1024$ **OR/*OF*** Pattern for the first terms in rows/*Patroon van die eerste terme in rye*: 2; 6; 14 ; 26 ; … 2 ; 4(1)+2 ; 4(1)+4(2)+2 ; 4(1)+4(2)+4(3)+2 ; …. $T_8 = 4(1+2+3+4+5+6+7)+2$ $= 114$ Sum of the terms in row 8/*Som van terme in ry 8* $= 114+118+122+136+130+134+138+142$ $= 1024$	✓gen./*alg*. term ✓ subst./*verv.* ✓ answ/*antw* (3) **OR/*OF*** ✓ $T_8 = 114$ ✓sum of terms in row/*som van terme in ry* 8 ✓ answ/*antw* (3)

3.2.2	Mean in row/*Gemiddeld in ry* 20 $= \frac{2(20)^3}{20} = 800$ **OR/*OF*** First term of row/*Eerste term in ry* 20: $T_{20} = 4(1+2+3+4+....+19)+2$ $= 762$ Sum of terms in row/*Som van terme in ry* 20 $= 762+766+770+...+838.$ $= 16000$ $\therefore$ Mean/*Gemiddeld* $= \frac{16000}{20} = 800$	✓ subst./*verv.* ✓ answ/*antw* (2) **OR/*OF*** ✓16 000 ✓ answ/*antw* (2)
		[13]

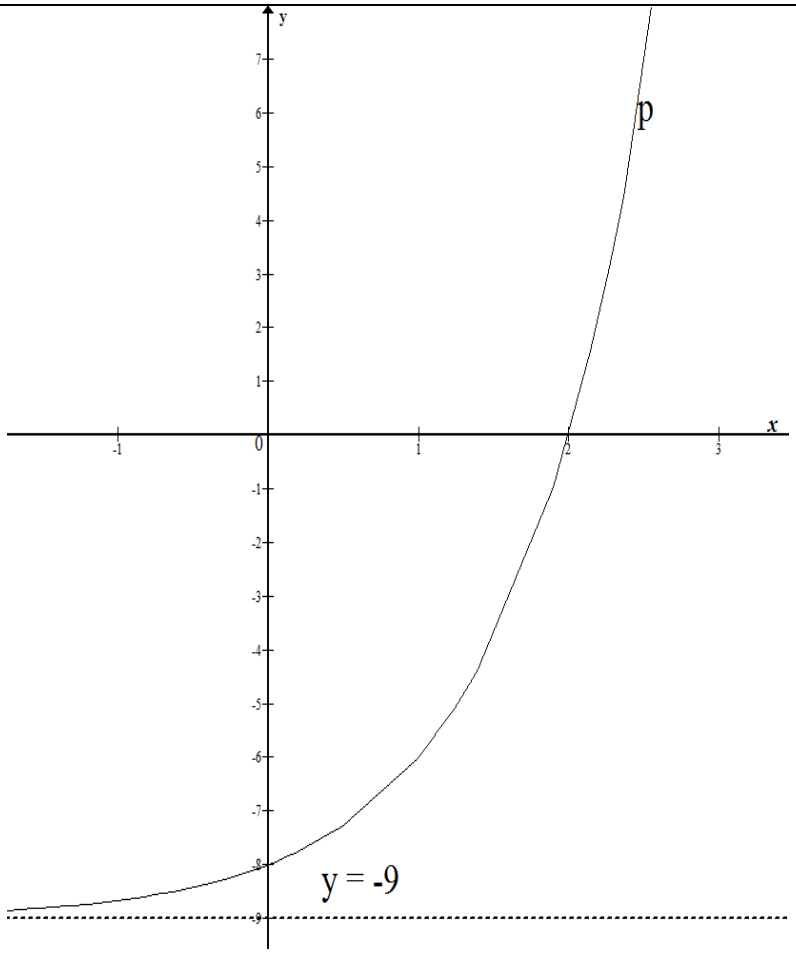
QUESTION/*VRAAG* 4

4.1.1	$SI = \frac{Prt}{100}$ $= \frac{18000 \times 4{,}5 \times 7}{100}$ $= R5670{,}00$ **OR/*OF*** $A = P(1 + i.n)$ $= 18000(1 + 0{,}045 \times 7)$ $= R23670$ Interest/*Rente* $= 23670 - 18000$ $= R5670$	✓ subst./*verv.* ✓ answ/*antw* (2) **OR/*OF*** ✓ R23 670 ✓R5 670 (2)
4.1.2	$A = P(1 + i)^n$ $R27660 = P(1 + 0{,}067)^5$ $P = \frac{27660}{(1 + 0{,}067)^5}$ $P = R20000$	✓ subst./*verv.* in correct formula/ *korrekte formule* ✓ simpl./*vereenv* ✓ answ/*antw* (3)
4.1.3	$A = P(1 + i.n)$ $27660 = 18000(1 + i \times 7)$ $7i = \frac{27660}{18000} - 1$ $i = \frac{\frac{27660}{18000} - 1}{7}$ $i = 0{,}07666....$ Simple interest rate should have been/ *Eenvoudige rente moes wees* 7,67%	✓ subst./*verv.* ✓ simpl./*vereenv* ✓ answ/*antw* (3)
4.2	$\frac{\text{Pound/}Pond}{\text{Dollar}} = \frac{R16{,}52}{R12{,}91}$ $\therefore £1 \approx \$1{,}28$ **OR/*OF*** $\frac{\text{Dollar}}{\text{Pound/}Pond} = \frac{R12{,}91}{R16{,}52}$ $\therefore \$1 \approx £0{,}78$	✓proportion/*verhouding* ✓ £1 ≈ $1,28 (2) **OR/*OF*** ✓proportion/*verhouding* ✓ $1 ≈ £0,78 (2)
		[10]

QUESTION/*VRAAG* 5

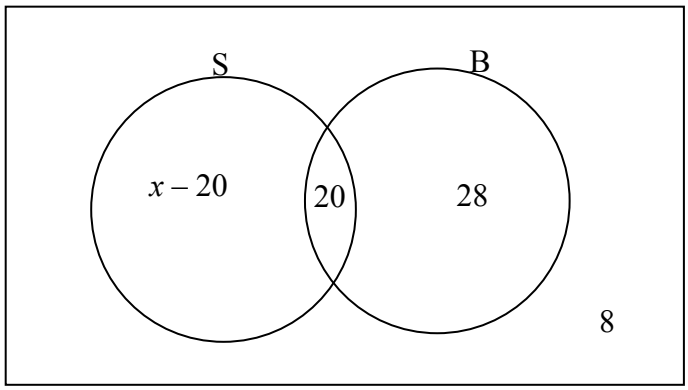
5.1	Range of/*Waardeversameling van* $g: y \leq 8$	✓ answ/*antw* (1)
5.2	$x = -2$	✓ answ/*antw* (1)
5.3	$g(x) = ax^2 + 8 \Rightarrow q = 8$ $g(2) = a(2)^2 + 8 = 0$ $\Rightarrow a = -2$	✓q = 8 ✓ subst./*verv.* (2 ; 0) ✓a = –2 (3)
5.4	$f(x) = mx + c \Rightarrow c = 8$ $f(-2) = -2m + 8 = 0$ $\Rightarrow m = 4$ $f(x) = 4x + 8$	✓c = 8 ✓subst./*verv.* (–2 ; 0) ✓m = 4 (3)
5.5.1	$x = -2$ or $x = 0$	✓ $x = -2$ ✓ $x = 0$ (2)
5.5.2	$x \,.\, g(x) \leq 0$ $-2 \leq x \leq 0$ or $x \geq 2$	✓✓$-2 \leq x \leq 0$ or ✓ $x \geq 2$ (3)
5.6	$h(x) = -(-2x^2 + 8)$ $h(x) = 2x^2 - 8$	✓✓ $2x^2 - 8$ (2)
		[15]

QUESTION/*VRAAG* 6

6.1.1	The range/*Waardeversameling van* is $y > -9$	✓ answ/*antw* (1)
6.1.2	$p(x) = k^x + q$ $p(x) = k^x - 9$ $0 = k^2 - 9$ $k^2 = 9$ $k = \pm 3$ $k = 3$ since $k > 0$ $p(x) = 3^x - 9$	✓q = –9 ✓subst/*verv.* (2 ; 0) ✓ $k = 3$ (3)
6.1.3		✓asymptote/*asimptoot* ✓intercepts/*afsnitte* ✓shape/*vorm* (3)

6.2.1	$w = -1$	✓ answ/*antw* (1)
6.2.2	$f(x) = \frac{k}{x} - 1$ $7 = \frac{k}{-2} - 1$ $k = -16$	✓ subst./*verv.* (2 ; –7) ✓ answ/*antw* (2)
6.2.3	$f(x) = g(x)$ $\frac{-16}{x} - 1 = -x - 1$ $x^2 - 16 = 0$ $(x-4)(x+4) = 0$ $x_Q = 4$ or $x_P = -4$	✓equating/*verg.* ✓ simpl./*vereenv* ✓x = -4 at/*by* P ✓x = 4 at Q (4)
6.2.4	$-4 < x < 0$ or $x > 4$	✓ $-4 < x < 0$ ✓ $x > 4$ (2)
		[16]

QUESTION/*VRAAG* 7

7.1.1	$P(A) + P(B) = 1$	✓ answ/*antw* (1)
7.1.2	$P(A \text{ and } B) = 0$	✓ answ/*antw* (1)
7.1.3	$P(B) = P(A')$ $= 0{,}35$	✓ answ/*antw* (1)
7.2.1	S = 150  	✓20 ✓28 ✓ $x - 20$ ✓8 (4)
7.2.2	$x - 20 + 20 + 28 + 8 = 150$ $x = 114$ Smartphone only/*Slegs slimfoon* $= 114 - 20$ $= 94$	✓equation/*verg.* ✓ value/*waarde* of/*van x* ✓ answ/*antw* (3)
7.2.3 (a)	P*(*S only/*slegs*$) = \frac{94}{150} = 0{,}63$	✓ answ/*antw* (1)
7.2.3 (b)	P*(*S or/*of* T or neither/*of geeneen*$) = \frac{94}{150} + \frac{28}{150} + \frac{8}{150}$ $= \frac{130}{150}$ $= \frac{13}{15}$ $= 0{,}87$	✓addition/*optel* ✓ answ/*antw* (2)
		[13]

TOTAL/*TOTAAL*: 100