



# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL  
SENIOR CERTIFICATE/  
NASIONALE  
SENIOR SERTIFIKAAT**

**GRADE/GRAAD 10**

**MATHEMATICS P1/WISKUNDE VI**

**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:**

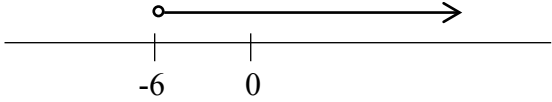
- *As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.*
- *Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.*
- *Dit is onaanvaarbaar dat 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/ <i>groepering</i> ✓ factors/faktore ✓ difference of two squares/ <i>verskil van twee kwadrate</i>  (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	$\frac{3^t - 3^{t-2}}{2 \cdot 3^t - 3^t}$ $= \frac{3^t(1 - 3^{-2})}{3^t(2 - 1)}$ $= \frac{1 - \frac{1}{9}}{1}$ $= \frac{8}{9}$	✓ 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	$3x - 4y = -4 \dots\dots\dots(1)$ $-2x - y = 10 \dots\dots\dots(2)$ $3x - 4y = -4 \dots\dots\dots(1)$ $(2) \times -4 : 8x + 4y = -40 \dots\dots\dots(3)$ $(1) + (3) : 11x = -44$ $x = -4$ <p>substitute <math>x = -4</math> into (2)</p> $-2(-4) - y = 10$ $y = -2$ <p><b>OR</b></p> <p>From(2): <math>y = -2x - 10 \dots\dots\dots(3)</math></p> <p>subst. (3) into (1) : <math>3x - 4(-2x - 10) = -4</math></p> $3x + 8x + 40 = -4$ $11x = -44$ $x = -4$ <p>subst. <math>x = -4</math> into (3) : <math>y = -2(-4) - 10</math></p> $y = -2$	✓ multipl/maal (2) by/met 4 ✓ adding/tel op (1) & (3) ✓ x-value/waarde  ✓ y-value/waarde  ✓ equation/verg (3) ✓ subst./verv.  ✓ x-value/waarde  ✓ y-value/waarde (4)
2.3.1	$\frac{x(x-5)}{6} - 1 = 0$ $x^2 - 5x - 6 = 0$ $(x-6)(x+1) = 0$ $x = 6 \text{ or } x = -1$	✓ 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/kwadring  ✓ answ/antw (2)

2.4	<p>Let Linda's age now be <math>x</math>/Laat Linda se ouderdom nou <math>x</math> wees  Therefore Tabela's age is <math>4x</math>/Dus is Tabela se ouderdom <math>4x</math>  6 years/jaar later: Linda's age will be:/  Linda se ouderdom sal wees: <math>x + 6</math>  Tabela's age will be:/  Tabela se ouderdom sal wees: <math>4x + 6</math>  <math>4x + 6 = 3(x + 6)</math>  <math>4x - 3x = 18 - 6</math>  <math>x = 12</math>  Linda's age/Linda se ouderdom is 12 years/jaar</p>	<p>✓ <math>4x</math>  ✓ <math>x + 6</math>    ✓ equating/verg.    ✓ answ/antw</p> <p style="text-align: right;">(4)</p>
		<b>[16]</b>

**QUESTION/VRAAG 3**

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

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

**QUESTION/VRAAG 4**

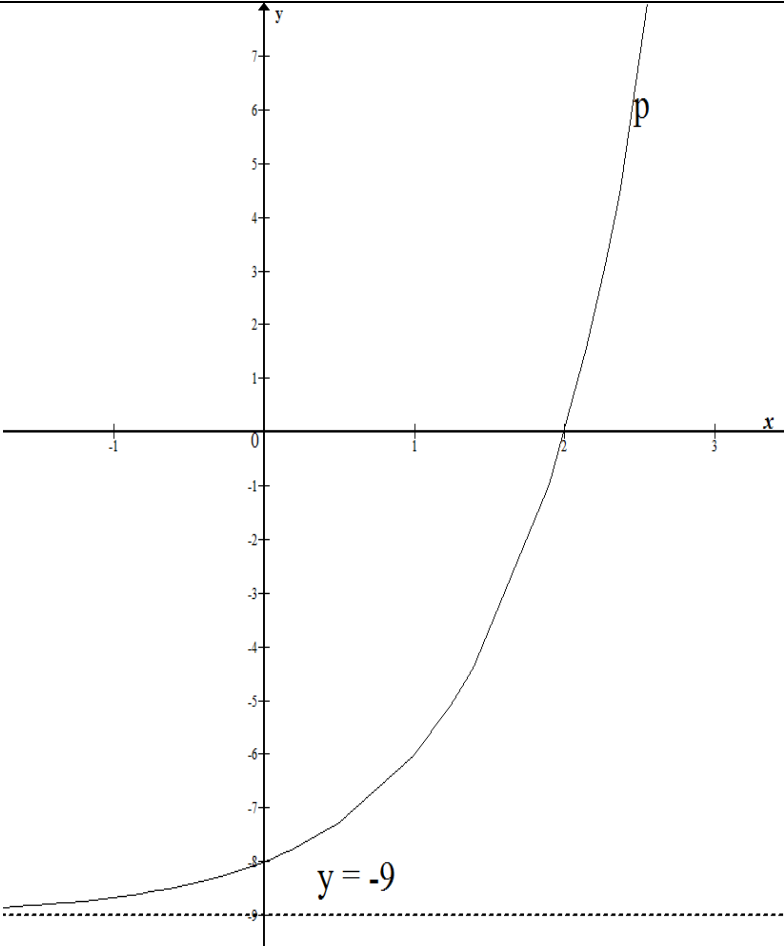
4.1.1	$SI = \frac{Prt}{100}$ $= \frac{18000 \times 4,5 \times 7}{100}$ $= R5670,00$ <p><b>OR/OF</b></p> $A = P(1 + i.n)$ $= 18000(1 + 0,045 \times 7)$ $= R23670$ <p>Interest/Rente = 23670 – 18000</p> $= R5670$	<p>✓ subst./verv.</p> <p>✓ answ/antw</p> <p>(2)</p> <p><b>OR/OF</b></p> <p>✓ R23 670</p> <p>✓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



**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	$x \cdot g(x) \leq 0$ $-2 \leq x \leq 0$ 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)
		<b>[15]</b>

**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	$f(x) = g(x)$ $\frac{-16}{x} - 1 = -x - 1$ $x^2 - 16 = 0$ $(x - 4)(x + 4) = 0$ $x_Q = 4 \text{ or } x_P = -4$	✓ 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)
		<b>[16]</b>

**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	<p><math>S = 150</math></p> <p>A Venn diagram with two overlapping circles, S and B, inside a rectangle. The rectangle is labeled S = 150. Circle S is on the left and circle B is on the right. The region of S that does not overlap with B is labeled x - 20. The intersection of S and B is labeled 20. The region of B that does not overlap with S is labeled 28. The region outside both circles but inside the rectangle is labeled 8.</p>	<p>✓ 20 ✓ 28 ✓ x - 20 ✓ 8</p> <p>(4)</p>
7.2.2	$x - 20 + 20 + 28 + 8 = 150$ $x = 114$ <p>Smartphone only/Slegs slimfoon = <math>114 - 20</math> <math>= 94</math></p>	<p>✓ equation/verg. ✓ value/waarde of/van x</p> <p>✓ answ/antw (3)</p>
7.2.3 (a)	$P(\text{S only/slegs}) = \frac{94}{150} = 0,63$	✓ answ/antw (1)
7.2.3 (b)	$P(\text{S or/of T or neither/of geeneen}) = \frac{94}{150} + \frac{28}{150} + \frac{8}{150}$ $= \frac{130}{150}$ $= \frac{13}{15}$ $= 0,87$	<p>✓ addition/optel</p> <p>✓ answ/antw (2)</p>
		<b>[13]</b>

**TOTAL/TOTAAL: 100**