Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

GRADE/*GRAAD* 10

NOVEMBER 2018

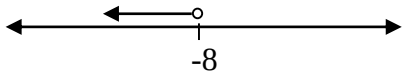
TECHNICAL MATHEMATICS P1/*TEGNIESE WISKUNDE V1*
MARKING GUIDELINE/*NASIENRIGLYN*

MARKS/*PUNTE*: 100

This marking guideline consists of 8 pages./
Hierdie nasienriglyn bestaan uit 8 bladsye.

QUESTION/*VRAAG 1*				
NO.	**SOLUTION/*OPLOSSING***		**EXPLANATION/ *VERDUIDELIKING***	
1.1	1.1.1	$\sqrt[3]{9}$	✓answer / *antwoord*	(1)
	1.1.2	$\sqrt{9}$	✓answer / *antwoord*	(1)
1.2	$\sqrt{9} < \sqrt{11} < \sqrt{16}$ $\sqrt{11}$ lies between / *lê tussen* 3 and/*en* 4		✓ 3 ✓ 4	(2)
1.3	$7x^2 - 2x - 6 - (3x^2 - 5x - 7)$ $= 7x^2 - 2x - 6 - 3x^2 + 5x + 7$ $= 4x^2 + 3x + 1$		✓ $-3x^2 + 5x + 7$ ✓ answer / *antwoord*	(2)
1.4	$1001_2 \overline{)111111_2}$ 111_2 1001_2 1101_2 1001_2 1001_2 1001_2 0000 Answer / *Antwoord* $= 111_2 = 7$		✓ method / *metode* ✓ 111_2 ✓ 7	(3)
1.5	1.5.1	$2x^2 + 4x - 2x^2 + 3x + 3$ $= 7x + 3$	✓ $2x^2 + 4x$ ✓ $3x + 3$ ✓ answer / *antwoord*	(3)
	1.5.2	$a^3 + 3a^2 + 9a - 3a^2 - 9a - 27$ $= a^3 - 27$	✓ $a^3 + 3a^2 + 9a$ ✓ $-3a^2 - 9a - 27$ ✓ answer / *antwoord*	(3)
	1.5.3	$-2 + 6i - 3i + 9i^2$ $= -2 + 3i + 9(-1)$ $= -11 + 3i$	✓ product / *produk* ✓$i^2 = -1$ ✓ answer / *antwoord*	(3)
				[18]

QUESTION/*VRAAG 2*				
NO.		**SOLUTION/*OPLOSSING***	**EXPLANATION/ *VERDUIDELIKING***	
2.1	2.1.1	$(x^2+9)(x^2-9) = (x^2+9)(x-3)(x+3)$	✓ $(x^2+9)(x^2-9)$ ✓ $(x-3)(x+3)$	(2)
	2.1.2	$6x^2y - 10xy + 5x - 25$ $= (6x^2y - 10xy) + (15x - 25)$ $= 2xy(3x-5) + 5(3x-5)$ $= (3x-5)(2xy+5)$ **OR / *OF*** $(6x^2y + 15x) + (10xy - 25)$ $= 3x(2xy+5) - 5(2xy+5)$ $= (2xy+5)(3x-5)$	✓grouping / *groepering* ✓HCF / HGF ✓factors / *faktore*	(3)
2.2	2.2.1	$\frac{3^{x+2}.27^{x-2}}{81^x}$ $= \frac{3^x.3^2.(3^3)^{x-2}}{(3^4)^x}$ $= 3^{x+2+3x-6-4x}$ $= 3^{-4}$ $= \frac{1}{3^4} = \frac{1}{81}$	✓ 3^3 and/*en* 3^4 ✓ simplification / *vereenvoudiging* ✓ 3^{-4} ✓ answer / *antwoord*	(4)
	2.2.2	$\frac{x^3+y^3}{2x^3-x^2y-3xy^2} \div \frac{x^3y-x^2y^2+xy^3}{4x^4-9x^2y^2}$ $= \frac{(x+y)(x^2-xy+y^2)}{x(2x-3y)(x+y)} \times \frac{x^2(2x-3y)(2x+3y)}{xy(x^2-xy+y^2)}$ $= \frac{2x+3y}{y}$	✓ factorising sum of two cubes *faktorisering van som van twee derdemagte* ✓ $x(2x-3y)(x+y)$ ✓ $xy(x^2-xy+y^2)$ ✓ $x^2(2x-3y)(2x+3y)$ ✓ answer / *antwoord*	(5)
				[14]

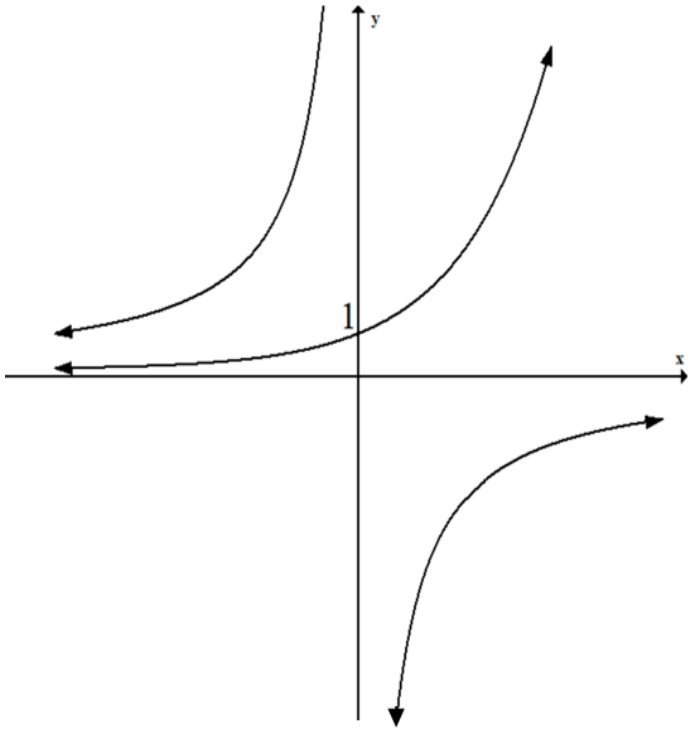
QUESTION/*VRAAG 3*				
NO.	**SOLUTION/*OPLOSSING***		**EXPLANATION/ *VERDUIDELIKING***	
3.1	3.1.1	$5^x = 5^{-3}$ $x = -3$	✓ 5^{-3} ✓ answer / *antwoord*	(2)
	3.1.2	$3x + 1 = 2x$ $3x - 2x = -1$ $x = -1$	✓ $2x$ ✓ $3x - 2x = -1$ ✓ answer / *antwoord*	(3)
	3.1.3	$x = -13\ or/of\ x = 1$	✓ -13 ✓ 1	(2)
	3.1.4	$3x + 21 < \frac{x}{2} + 1$ $6x + 42 < x + 2$ $5x = -40$ $x < -8$ **OR / *OF*** $3x - \frac{x}{2} < 1 - 21$ $\frac{5x}{2} < -20$ $x = -8$  	✓$3x + 21$ ✓$6x + 42 < x + 2$ ✓answer / *antwoord* ✓ indicating numbers to the left of -8 and -8 not included / *Toon aan getalle links van -8 en -8 is nie ingesluit nie.*	(4)
				[11]

QUESTION/*VRAAG 4*				
NO.		**SOLUTION/*OPLOSSING***	**EXPLANATION/ *VERDUIDELIKING***	
4.1	$1.675 \times 10^{-27} kg$		✓✓ answer / *antwoord*	(2)
4.2	$R = \sqrt{\frac{A}{\pi} + r^2}$		✓✓ answer / *antwoord*	(2)
4.3	$S = vt$ Car/*Kar* $v = x + 5$ $S = (x + 5)4$ Truck/*Trok* $v = x$ $s = 4x$ $4(x + 5) + 4x = 380$ $x = 45$ Truck speed/Trokspoed $= 45\ km/h$ Car speed/Karspoed $= 50\ km/h$		✓ $s = (x + 5)4$ ✓ $s = 4x$ ✓ $4(x + 5) + 4x = 380$ ✓ $x = 45$ ✓ car speed / *kar spoed* ✓ truck speed / *trok spoed*	(6)
4.4	4.4.1	Floor plan-1/*Vloerplan-1* $2(2x - 10) + 2(5 + y) = 70$ $4x - 20 + 10 + 2y = 70$ $y + 2x = 40$ …….(1) Floor plan-2/*Vloerplan-2* $2(2x - 10) + 2[\frac{1}{2}(5 + y)]$=60 $4x - 20 + 5 + y = 60$ $4x + y = 75$ …….(2)	✓sum of the lengths= $70\ m$ *som van die lengtes = 70 m* ✓$y + 2x = 40$ ✓sum of the lengths $= 60\ m$ *som van die lengtes = 60 m* ✓$4x - 2y = 75$	(4)

	4.4.2	From equation (1) / *Vanaf vergelyking (1)* $y = 40 - 2x$ ……(3) Substitute eq (3) in eq (2) / *Vervang verg.(3) in verg.(2)* $4x + (40 - 2x) = 75$ $2x = 35$ $\therefore x = \frac{35}{2} = 17{,}5$ Substitute the value of x into(3)/*Vervang waarde van x in (3)* $y = 40 - 2\left(\frac{35}{2}\right)$ $y = 5$ **OR / *OF*** $2x + y = 40$ ……. (1) $4x + y = 75$…… (2) (2) – (1) $2x = 35$ $x = \frac{35}{2} = 17.5$ $y = 5$	✓$y = 40 - 2x$ ✓substitution / *vervanging* ✓x-value / *x-waarde* ✓y-value / *y-waarde*	(4)
				[18]

QUESTION/*VRAAG 5*

NO.		**SOLUTION/*OPLOSSING***	**EXPLANATION/ *VERDUIDELIKING***	
5.1	5.1.1	A $(-2; 0)$ B $(2; 0)$ C $(0; 4)$ D $(0; -2)$	✓✓ (-2;0) ✓✓ (2;0) ✓✓ (0;4) ✓✓ (0;-2)	(8)
	5.1.2	$f(x) = g(x)$ $-x^2 + 4 = x - 2$ $x^2 + x - 6 = 0$ $(x + 3)(x - 2) = 0$ $x = -3$ *or* $x = 2$ $y = -3 - 2 = -5$ E$(-3 - 5)$	✓equating the functions / *gelykstel van die funksies* ✓standard form / *standaardvorm* ✓factors / *faktore* ✓x-values / *x-waardes* ✓y-value / *y-waarde* ✓coordinates of E / *koördinate van* E	(6)
	5.1.3	CD= $OC + OD$ $= 4 + 2 = 6$ units / *eenhede*	✓$4 + 2$ ✓answer / *antwoord*	(2)

5.2	5.2.1	$x \in R$	✓answer / *antwoord*	(1)
	5.2.2	$y \leq 4$ OR/*OF* y	✓answer / *antwoord*	(1)
5.3	$j(x) = -(x^2 + 4)$ $= x^2 - 4$		✓substitution / *vervanging* ✓answer / *antwoord*	(2)
5.4			✓shape of *k* / *vorm van k* ✓asymptotes of *k* / *asimptote van k* ✓y-intercept of *h* *y-afsnit van h* ✓shape of *h* / *vorm van h* ✓asymptote of *h* *asimptote van h*	(5)
				[25]

QUESTION/*VRAAG 6*				
NO.	**SOLUTION/*OPLOSSING***		**EXPLANATION/ *VERDUIDELIKING***	
6.1	$A = P(1+i)^n$ $R30\,000 = P(1+0.135)^{11}$ $P = R7450{,}18$		✓formula / *formule* ✓substitution / *vervanging* ✓answer / *antwoord*	(3)
6.2	6.2.1	$R200\,000$	✓answer / *antwoord*	(1)
	6.2.2	Simple interest, because the interest is constant. *Enkelvoudige rente, omdat die rente konstant is.*	✓ Simple interest / *Enkelvoudige rente* ✓ reason / *rede*	(2)
	6.2.3	$R200\,000 + 25\,000 + 25\,000 + 25\,000 + 25\,000 + 25\,000 + 25\,000 = R350\,000$ It will cost $R350\,000$ / *Dit sal R350 000 kos* **OR/*OF*** In 2018, it cost/*kos dit* $R325\,00$ ∴ In 2019, it will cost/*sal dit kos* $= R325\,00 + R25\,000$ $= R350\,000$	✓method / *metode* ✓answer / *antwoord*	(2)
	6.2.4	$A = P(1+in)$ $325\,000 = 200\,000(1+5i)$ $1{,}625 = 1+5i$ $0{,}625 = 5i$ $i = 0{,}125$ Interest rate/*Rentekoers* $= 12{,}5\%$	✓formula / *formule* ✓substituting (any point from the graph) *vervanging (enige punt vanaf die grafiek)* ✓$0{,}625 = 5i$ ✓answer / *antwoord*	(4)
6.3	$A = P(1-in)$ $= 385000(1-0{,}06\times 5)$ $= R269500$		✓ substituting in a correct formula *Vervaning in 'n korrekte formule* ✓answer / *antwoord*	(2)
				[14]
			TOTAL/*TOTAAL*:	**100**