



GAUTENG DEPARTMENT OF EDUCATION
GAUTENGSE DEPARTEMENT VAN ONDERWYS
PROVINCIAL EXAMINATION
PROVINSIALE EKSAMEN
JUNE / JUNIE 2018
GRADE / GRAAD 9

MATHEMATICS
WISKUNDE

MEMORANDUM

7 pages / bladsye

SECTION /AFDELING A

1.1	B✓	1 mark for each / <i>punt vir elkeen</i>
1.2	D✓	
1.3	B✓	
1.4	C✓	
1.5	C✓	
1.6	A✓	
1.7	D✓	
1.8	B✓	
1.9	A✓	
1.10	B✓	

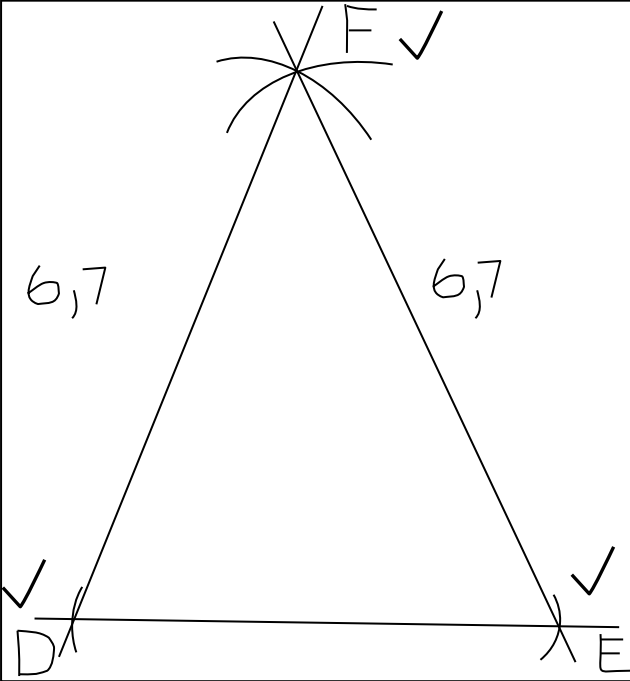
SECTION /AFDELING B

1.1.	$3,56 \times 10^{-6}$ ✓	1 mark for answer / <i>punt vir antwoord</i>
1.2.1	4 ✓	1 mark for answer / <i>punt vir antwoord</i>
1.2.2	$-6a$ ✓	1 mark for answer / <i>punt vir antwoord</i>
1.2.3	9 ✓	1 mark for answer / <i>punt vir antwoord</i>
1.3.1	$xy^2 - 3x^2y - 10xy^2 + 17xy^2 - 10x^2$ $= -9xy^2 + 14x^2y - 10x^2$ ✓✓	2 marks for answer / <i>punte vir antwoord</i>
1.3.2	$(4x - y)^2 + 8xy$ $= 16x^2 - 8xy + y^2 + 8xy$ ✓ $= 16x^2 + y^2$ ✓	1 mark for/ <i>punt vir</i> $16x^2 - 8xy + y^2$ 1 mark for answer / <i>punt vir antwoord</i>
1.3.3	$\frac{2^2 \cdot 2^3 \cdot 8}{4^5}$ $= \frac{2^2 \cdot 2^3 \cdot 2^3}{2^{2(5)}} \checkmark$ $= \frac{2^{2+3+3}}{2^{10}} \checkmark$ $= \frac{2^{10}}{2^{10}}$ $= 2^{8-10}$ $= 2^{-2} = \frac{1}{4} \checkmark$ $= \frac{1}{4}$	1 mark for / <i>punt vir</i> $8 = 2^3$ / 1 mark for denominator / <i>punt vir noemer</i> 1 mark for answer / <i>punt vir antwoord</i>

2.1	$4a^3 - 12a^2 - 36a$ $= 4a(a^2 - 3a - 9) \checkmark \checkmark$	1 mark for common factor $4a$ / <i>punt vir gemene deler</i> $4a$. 1 mark for $(a^2 - 3a - 9)$ / <i>punt vir</i> $(a^2 - 3a - 9)$
2.2	$9(x + y) - y^2(x + y)$ $= (x + y)(9 - y^2) \checkmark \checkmark$ $= (x + y)(3 - y)(3 + y) \checkmark$	1 mark for common factor / <i>punt vir gemene deler</i> $(x + y)$. 1 mark for / <i>punt vir</i> $(9 - y^2)$ 1 mark for / <i>punt vir</i> $(3 - y)(3 + y)$
3.1	$6y = 5y - 4$ $6y - 5y = -4$ $y = -4 \checkmark \checkmark$	2 marks for answer / <i>punte vir antwoord</i>
3.2	$(2^x)^2 = 128$ $2^{2x} = 2^7 \checkmark$ $\therefore 2x = 7 \checkmark$ $x = \frac{7}{2} \checkmark$ $x = 3\frac{1}{2} \checkmark$	1 mark for $2^{2x} = 2^7$ / <i>punt vir</i> $2^{2x} = 2^7$ 1 mark for $2x = 7$ / <i>punt vir</i> $2x = 7$ 1 mark dividing by 2 / <i>punt vir deel met 2</i> 1 mark for answer / <i>punt vir antwoord</i>
3.3	$\frac{2x-3}{2} - \frac{3x+1}{4} = 1$ $2(2x - 3) - 1(3x + 1) = 4 \checkmark$ $4x - 6 - 3x - 1 = 4 \checkmark$ $x - 7 = 4 \checkmark$ $x = 11 \checkmark$	1 mark for LCD / <i>punt vir KGD</i> 1 mark for simplification / <i>punt vir vereenvoudiging</i> 1 mark for/ <i>punt vir</i> $x - 7 = 4$ 1 mark for answer / <i>punt vir antwoord</i>
4.1.1	$A = P(1 + i)^n \checkmark$ $= R3350 \left(1 + \frac{14,5}{100}\right)^3 \checkmark$ $= R5\,028,76 \checkmark$	1 mark for formula / <i>punt vir formule</i> 1 mark for substitution/ <i>punt vir vervanging</i> 1 mark for answer / <i>punt vir antwoord</i>
4.1.2	$CI / ER = R5\,028,76 - R3\,350 \checkmark$ $= R1\,678,76 \checkmark$	1 mark for subtraction / <i>punt vir aftrekking</i> 1 mark for answer / <i>punt vir antwoord</i>

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4.2	$t = \frac{d}{s} \checkmark$ $= \frac{18}{6} \checkmark$ $= 3 \text{ hours / ure} \checkmark$					1 mark for formula / <i>punt vir formule</i> 1 mark for substitution / <i>punt vir vervanging</i> 1 mark for answer / <i>punt vir antwoord</i>
5.1.1	x	-2	-1	1	2	1 mark for each / <i>punt vir elkeen</i>
	y	$-7 \checkmark$	$-3 \checkmark$	$5 \checkmark$	$9 \checkmark$	
5.1.2	$y = 4x + 1 \checkmark$					1 mark for answer / <i>punt vir antwoord</i>
5.2.1	$y = 3x^2 \checkmark \checkmark$					2 marks for a $y = 3x^2$ / <i>punte vir $y = 3x^2$</i>
5.2.2	$y = 3(8)^2 \checkmark$ $a = 192 \checkmark$ $243 = 3(b)^2 \checkmark$ $b^2 = 81 \checkmark$ $b = 9 \checkmark$					1 mark for substitution / <i>punt vir vervanging</i> 1 mark for $a = 192$ / <i>punt vir $a = 192$</i> 1 mark for substitution / <i>punt vir vervanging</i> 1 mark for calculation/ <i>punt vir berekening</i> 1 mark for $b = 9$ / <i>punt vir $b = 9$</i>
6.1	False / Onwaar $\checkmark$					1 mark for answer / <i>punt vir antwoord</i>
6.2	False / Onwaar $\checkmark$					1 mark for answer / <i>punt vir antwoord</i>
6.3	False / Onwaar $\checkmark$					1 mark for answer / <i>punt vir antwoord</i>
6.4	False / Onwaar $\checkmark$					1 mark for answer / <i>punt vir antwoord</i>
6.5	True / Waar $\checkmark$					1 mark for answer / <i>punt vir antwoord</i>

7.1		1 mark for points F, D and E / 1 punt vir punte F, D en E 1 mark for $DF=EF=6,7\text{cm}$. 1 punt vir $DF=EF=6,7\text{cm}$ 1 mark for $DE=5,4\text{cm}$. 1 punt vir $DE=5,4\text{cm}$
7.2	$\hat{D} = 66^\circ \quad \hat{E} = 66^\circ \checkmark$ $\hat{F} = 48^\circ \checkmark$	1 mark for $\hat{D} = \hat{E} = 66^\circ$ 1 punt vir $\hat{D} = \hat{E} = 66^\circ$ 1 mark for $\hat{F} = 48^\circ$ / 1 punt vir $\hat{F} = 48^\circ$
7.3	$\triangle DEF$ is an isosceles triangle. $\checkmark$ $\triangle DEF$ is 'n gelyksydige driehoek. $\checkmark$	1 mark for answer / 1 punt vir antwoord.
8.1	$\hat{B}_2 + \hat{B}_3 = 180^\circ - 130^\circ$ Angles on straight line / Hoeke op reguit lyn. $\checkmark$ $\hat{B}_2 + \hat{B}_3 = 50^\circ$ But / maar $\hat{B}_2 = \hat{B}_3$ DB bisects $\widehat{EBC}$. / DB halveer $\widehat{EBC}$. $\checkmark$ $\therefore \hat{B}_3 = 25^\circ \quad \checkmark$	1 mark for statement and reason / punt vir bewering en rede 1 mark for reason / punt vir rede 1 mark for answer / punt vir antwoord

8.2	$\hat{A} + \hat{B} + \hat{C}_2 = 180^\circ$ $\hat{A} + \hat{C}_2 = 90^\circ \checkmark$ But / maar $\hat{A} = \hat{C}_2$ $\hat{C}_2 = 45^\circ$ $\hat{C}_1 + \hat{C}_2 = 180^\circ$ $\hat{C}_1 = 180^\circ - 45^\circ$ $\hat{C}_1 = 135^\circ \checkmark$ $\hat{A} = \hat{C}_2 \checkmark$ and / en $\hat{B} = 90^\circ$ $\hat{C}_2 = 45^\circ \checkmark$ $\hat{C}_1 = \hat{B} + \hat{A}$ $\hat{C}_1 = 90^\circ + 45^\circ$ $\hat{C}_1 = 135^\circ \checkmark$	Sum of angles of triangle. / Som van hoeke van driehoek. $\checkmark$ Angles opp. equal sides / Hoeke teenoor gelyke sye. $\checkmark$ Angles on straight line / Hoeke op reguit lyn $\checkmark$ Angles on straight line / Hoeke op reguit lyn or / of Angles opp. equal sides / Hoeke teenoor gelyke sye. $\checkmark$ ext. angle of triangle / buitehoek van 'n driehoek $\checkmark$	1 mark for statement and reason / punt bewering en rede 1 mark for answer / punt vir antwoord 1 mark for statement and reason / punt bewering en rede 1 mark for answer / punt vir antwoord 1 mark for answer / punt vir antwoord or / of 1 mark for statement / punt vir bewering 1 mark for reason / punt vir rede 1 mark for answer / punt vir antwoord 1 mark for statement and reason / punt vir bewering en rede 1 mark for answer / punt vir antwoord
8.3	$\hat{S} + Q\hat{R}S = 180^\circ$ $3x^\circ - 40^\circ + 2x^\circ + 10^\circ = 180^\circ \checkmark$ $5x^\circ - 30^\circ = 180^\circ$ $5x^\circ = 150^\circ \checkmark$ $x = 30^\circ \checkmark$ $\therefore \hat{S} = 3(30^\circ) - 40^\circ \checkmark$ $\hat{S} = 90^\circ - 40^\circ$ $\hat{S} = 50^\circ \checkmark$	co-interior angles and $PS \parallel QR$ / ko-binne hoeke en $PS \parallel QR \checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$	1 mark for statement and reason / punt vir bewering en rede 1 mark for substitution / punt vir substitusie 1 mark for calculation / punt vir berekening 1 mark for $x = 30^\circ$ / punt vir $x = 30^\circ$ 1 mark for substitution / punt vir substitusie 1 mark for answer / punt vir antwoord

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8.4	In /in $\triangle MBC$ and / en $\triangle MDC$: $BM = MD$ radii / radius ✓ $BC = CD$ given / gegee ✓ $MC = MC$ common side / gemene sy ✓ $\triangle MBC \equiv \triangle MDC$ sss / sss ✓	1 mark for statement and reason / punt vir bewering en rede 1 mark for statement and reason / punt vir bewering en rede 1 mark for statement / punt vir bewering 1 mark for reason / punt vir rede
8.5.1	$\hat{A} = \hat{C}$ alt. angles and $AB \parallel DC$ / verw. hoeke en $AB \parallel DC$ ✓ $\hat{B} = \hat{D}$ alt. angles and $AB \parallel DC$ / verw. hoeke en $AB \parallel DC$ ✓ $\hat{T}_1 = \hat{T}_2$ vert. opp angles / regoorstaande hoeke ✓ $\triangle ABT \equiv \triangle CDT$ $\angle\angle\angle$ ✓	1 mark for statement and reason / punt vir bewering en rede 1 mark for statement and reason / punt vir bewering en rede 1 mark for statement / punt vir bewering 1 mark for reason / punt vir rede
8.5.2	$\frac{AB}{CD} = \frac{BT}{DT} = \frac{AT}{CT}$ prop. sides of similar triangles / eweredige sye van gelyksoortige driehoeke ✓ $\frac{10}{6} = \frac{AT}{8}$ ✓ $AT = \frac{80}{6} = 13,33 \dots$ ✓	1 mark for statement and reason / punt vir bewering en rede 1 mark for substitution / punt vir substitusie 1 mark for / punt vir $\frac{80}{6}$ / 13,33.
9.	$KL^2 = KM^2 - ML^2$ Pythagoras ✓ $= 10^2 \text{ cm}^2 - 6^2 \text{ cm}^2$ ✓ $= 100 \text{ cm}^2 - 36 \text{ cm}^2$ $= 64 \text{ cm}^2$ ✓ $KL = 8 \text{ cm}$ ✓ Area $\triangle KMN = \frac{1}{2} \times b \times h$ or / of Area $\triangle KMN = \frac{1}{2} \times MN \times KL$ ✓ $60 \text{ cm}^2 = \frac{1}{2} \times MN \times 8 \text{ cm}$ ✓ $MN = \frac{60 \text{ cm}^2}{4 \text{ cm}}$ $MN = 15 \text{ cm}$ ✓	1 mark for statement / punt vir bewering 1 mark for substitution / punt vir vervanging 1 mark for calculation / punt vir berekening 1 mark for answer / punt vir antwoord 1 mark for formula / punt vir formule 1 mark for substitution / punt vir vervanging 1 mark for answer / punt vir antwoord
		TOTAL / TOTAAL: 100