GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

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 / *punt vir elkeen*
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✓	

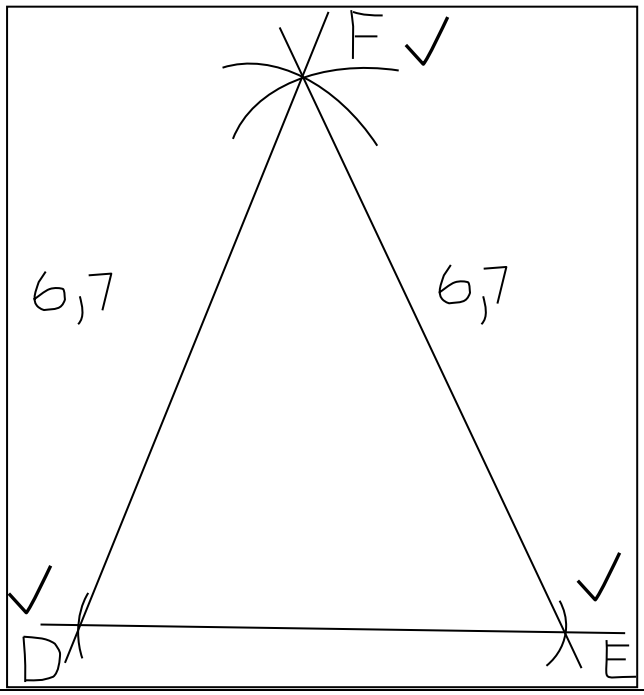
SECTION /*AFDELING* B

1.1.	$3{,}56 \times 10^{-6}$✓	1 mark for answer / *punt vir antwoord*
1.2.1	4 ✓	1 mark for answer / *punt vir antwoord*
1.2.2	$-6a$ ✓	1 mark for answer / *punt vir antwoord*
1.2.3	9 ✓	1 mark for answer / *punt vir antwoord*
1.3.1	$xy^2 - 3x^2y - 10xy^2 + 17xy^2 - 10x^2$ $= -9xy^2 + 14x^2y - 10x^2$ ✓✓	2 marks for answer / *punte vir antwoord*
1.3.2	$(4x - y)^2 + 8xy$ $= 16x^2 - 8xy + y^2 + 8xy$ ✓ $= 16x^2 + y^2$✓	1 mark for/ *punt vir* $16x^2 - 8xy + y^2$ 1 mark for answer / *punt vir antwoord*
1.3.3	$\frac{2^2.\ 2^3.\ 8}{4^5}$ $= \frac{2^2.\ 2^3.2^3}{2^{2(5)}}$✓ $= \frac{2^{2+3+3}}{2^{10}}$ ✓ $= 2^{8-10}$ $= 2^{-2} = \frac{1}{4}$ ✓ $= \frac{1}{4}$	1 mark for / *punt vir* $8 = 2^3$/ 1 mark for denominator / *punt vir noemer* 1 mark for answer / *punt vir antwoord*

2.1	$4a^3 - 12a^2 - 36a$ $= 4a(a^2 - 3a - 9)$ ✓✓	1 mark for common factor $4a$ / *punt vir gemene deler* $4a$. 1 mark for $(a^2 - 3a - 9)$ / *punt vir* $(a^2 - 3a - 9)$

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

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

7.1		1 mark for points F, D and E / *1 punt vir punte F, D en E* 1 mark for DF=EF=6,7cm. *1 punt vir DF=EF=6,7cm* 1 mark for DE=5,4cm. *1 punt vir DE=5,4cm*
7.2	$\hat{D} = 66°$ $\hat{E} = 66°$✓ $\hat{F} = 48°$✓	1 mark for $\hat{D} = \hat{E} = 66°$ *1 punt vir* $\hat{D} = \hat{E} = 66°$ 1 mark for $\hat{F} = 48°$ / 1 punt vir $\hat{F} = 48°$
7.3	ΔDEF is an isosceles triangle.✓ ΔDEF *is 'n gelyksydige driehoek.*✓	1 mark for answer / *1 punt vir antwoord.*
8.1	$\hat{B}_2 + \hat{B}_3 = 180° - 130°$ Angles on straight line / *Hoeke op reguit lyn.* ✓ $\hat{B}_2 + \hat{B}_3 = 50°$ But / *maar* $\hat{B}_2 = \hat{B}_3$ DB bisects E$\hat{B}$C. / *DB halveer* $E\hat{B}C$. ✓ $\therefore \hat{B}_3 = 25°$ ✓	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	$\hat{A} + \hat{B} + \hat{C}_2 = 180°$ $\hat{A} + \hat{C}_2 = 90°$✓ But / maar $\hat{A} = \hat{C}_2$ $\hat{C}_2 = 45°$ $\hat{C}_1 + \hat{C}_2 = 180°$ $\hat{C}_1 = 180° - 45°$ $\hat{C}_1 = 135°$ ✓ $\hat{A} = \hat{C}_2$✓ and / *en* $\hat{B} = 90°$ $\hat{C}_2 = 45°$✓ $\hat{C}_1 = \hat{B} + \hat{A}$ $\hat{C}_1 = 90° + 45°$ $\hat{C}_1 = 135°$✓	Sum of angles of triangle. / *Som van hoeke van driehoek.* ✓ Angles opp. equal sides / *Hoeke teenoor gelyke sye*. ✓ Angles on straight line / *Hoeke op reguit lyn*✓ Angles on straight line / *Hoeke op reguit lyn* **or / *of*** Angles opp. equal sides / *Hoeke teenoor gelyke sye*. ✓ ext. angle of triangle / *buitehoek van 'n driehoek*✓	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	$\hat{S} + Q\hat{R}S = 180°$ $3x° - 40° + 2x° + 10° = 180°$ ✓ $5x° - 30° = 180°$ $5x° = 150°$ ✓ $x = 30°$ ✓ $\therefore \hat{S} = 3(30°) - 40°$ ✓ $\hat{S} = 90° - 40°$ $\hat{S} = 50°$ ✓	co-interior angles and PS∥QR / *ko-binne hoeke en PS∥QR* ✓	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 $x = 30°$ / *punt vir* $x = 30°$ 1 mark for substitution / *punt vir substitusie* 1 mark for answer / *punt vir antwoord*

8.4	In /in ΔMBC and / *en* ΔMDC: $BM = MD$ radii / *radius* ✓ $BC = CD$ given / *gegee*✓ $MC = MC$ common side / *gemene sy*✓ $\Delta MBC \equiv \Delta MDC$ 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∥DC / *verw. hoeke en* $AB \parallel DC$✓ $\hat{B} = \hat{D}$ alt. angles and AB∥DC / *verw. hoeke en* $AB \parallel DC$✓ $\hat{T}_1 = \hat{T}_2$ vert. opp angles / *regoorstaande hoeke*✓ $\Delta ABT \Vert\Vert\Vert \Delta CDT$ $\angle\angle\angle$ ✓	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*✓ $\frac{10}{6} = \frac{AT}{8}$✓ $AT = \frac{80}{6} = 13{,}33 \ldots$ ✓	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✓ $= 10^2\ cm^2 - 6^2\ cm^2$✓ $= 100\ cm^2 - 36\ cm^2$ $= 64\ cm^2$✓ $KL = 8\ cm$✓ Area $\Delta KMN = \frac{1}{2} \times b \times h$ or / of Area $\Delta KMN = \frac{1}{2} \times MN \times KL$ ✓ $60\ cm^2 = \frac{1}{2} \times MN \times 8\ cm$ ✓ $MN = \frac{60\ cm^2}{4\ cm}$ $MN = 15\ cm$✓	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