GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

GAUTENGSE DEPARTEMENT VAN ONDERWYS

PROVINCIAL EXAMINATION

PROVINSIALE EKSAMEN

JUNE / *JUNIE* 2017

GRADE / *GRAAD* 9

MATHEMATICS
WISKUNDE

MEMORANDUM

8 pages / *bladsye*

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MATHEMATICS / *WISKUNDE*

QUESTION 1 / *VRAAG 1*

Q/V	ANSWER / *ANTWOORD*	MARK ALLOCATION / *PUNTE-TOEKENNING*
1.1.	B	1 mark / *punt*
1.2.	B	1 mark / *punt*
1.3.	B	1 mark / *punt*
1.4.	C	1 mark / *punt*
1.5.	D	1 mark / *punt*
1.6.	C	1 mark / *punt*
1.7.	C	1 mark / *punt*
1.8.	D	1 mark / *punt*
1.9.	D	1 mark / *punt*
1.10	A	1 mark / *punt*

QUESTION 2 / *VRAAG 2*

Q/V	ANSWER / *ANTWOORD*	MARK ALLOCATION / *PUNTETOEKENNING*
2.1.1	$-a^2b + 3ab^2 + 2a^2b - 4ab^2$ $a^2b - ab^2$	1 mark for / *punt vir* $3{,}5\ x$
2.1.2	$2(x + y) + 4(3x - 2y) - 4(2x - 3y)$ $= 2x + 2y + 12x - 8y - 8x + 12y$ $= 6x + 6y$	1 mark for / *punt vir* $2x + 2y + 12x - 8y - 8x + 12y$ 1 mark for / *1 punt vir* $6x + 6y$
2.1.3	$\frac{(2a^2b^3)^2(2a^{-2}b)^3}{4a^6b^{-1}}$ $= \frac{4a^4b^6 \times 8a^{-6}b^3}{4a^6b^{-1}}$ $= \frac{32a^{-2}b^9}{4a^6b^{-1}}$ $= \frac{8b^{10}}{a^8}$ **OR / *OF*** $= \frac{4a^4b^6 \times 8a^{-6}b^3}{4a^6b^{-1}}$ $= \frac{8a^{-2}b^9}{a^6b^{-1}}$ $= \frac{8b^{10}}{a^8}$	1 mark for / *punt vir* $4a^2b^6 \times 8a^{-6}b^3$ 1 mark for / *punt vir* $32a^{-4}b^9$ 1 mark for / *punt vir* $8b^{10}$ 1 mark for / *punt vir* a^{10}
2.1.4	$\sqrt[3]{\frac{-27x^3}{64}}$ $= \frac{-3x}{4}$	1 mark for / *punt vir* $-3x$ 1 mark for / *punt vir* for 4
2.2.1	$5(x - 2) = 3x - 4$ $5x - 10 = 3x - 4$ $5x - 3x = -4 + 10$ $2x = 6$ $x = 3$	1 mark for / *punt vir* $5x - 10$ 1 mark for / *punt vir* for $2x = 6$ 1 mark for / *punt vir* for $x = 3$
2.2.2	$3^{x-1} = 81$ $3^{x-1} = 3^4$ $x - 1 = 4$ $x = 5$	1 mark for / *punt vir* for 3^4 1 mark for / *punt vir* $x - 1 = 4$ 1 mark for / *1 punt vir* $x = 5$
2.2.3	$\frac{x}{3} + \frac{x}{4} = 1$ $4x + 3x = 12$ $7x = 12$ $x = \frac{12}{7}$	1 mark for / *punt vir* $4x + 3x = 12$ 1 mark for / *punt vir* $7x = 12$ 1 mark for / *punt vir* $x = \frac{12}{7}$
2.3.	$x^2 - (2xy)^3$ $= (-1)^2 - (2(-1)(2))^3$ $= 1 - (-4)^3$ $= 1 - (-64)$ $= 65$	1 mark for substitution / *punt vir vervanging* 1 mark for / *punt vir* $1 - (-64)$ 1 mark for / *punt vir* 65

QUESTION 3 / *VRAAG 3*

Q/V	ANSWER / *ANTWOORD*	MARK ALLOCATION/ *PUNTETOEKENNING*
3.1.1	$\frac{20}{100}$ x 50 000,00 = R 10 000,00 Deposit / *Deposito*	1 mark for / *punt vir* $\frac{20}{100}$ x 50 000,00 1 mark for / *punt vir* R 10 000.00
3.1.2	A = P(1 + *i* x n) = R 40 000 (1 + 0,12 x 3) = R 54 400 Total amount = R 10 000 + R 54 400 *Totale bedrag* = R 64 400,00	1 mark formula / *punt vir formule* 1 mark for / *punt vir* R 54 400 1 mark for / *punt vir* R 10 000 + R 54 400 1 mark for / *punt vir* R 64 400
3.1.3	$A = P(1 + i)^n$ $= 50\,000(1 + 0{,}09)^{3{,}5}$ = R 67 602,50	1 mark formula correct / *punt vir korrekte formule* 1 mark for / *punt vir* 50 000(1 + 0,09) 1 mark for / *punt vir* 3,5 1 mark for / *punt vir* R 67 602,50
3.1.4	Option 1, it is a cheaper option than Option 2 / *Opsie 1, dit is 'n goedkoper opsie as opsie 2* (or any reasonable explanation)	1 mark for Option 1 / *punt vir Opsie 1* 1 mark for reason / *punt vir rede*
3.2.1	1 ÷ 0,1923 = R 5,20	1 mark for / *punt vir* R5,20
3.2.2 (a)	S$ 1 = R 5,20 S$ 550 = R 5,20 x 550 = R 2 860	1 mark for / *punt vir* R 5,20 x 550 1 mark for / *punt vir* R 2 860
(b)	Number of DVDs = R 2860 ÷ 100 *Aantal DVD's* = 28,6 ≈ 28	1 mark for / *punt vir* R 2860 ÷ 100 1 mark for / *punt vir* 28

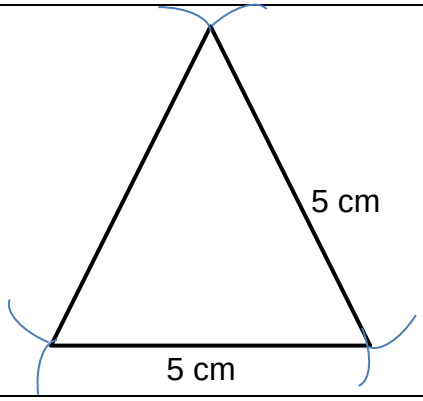
QUESTION 4 / *VRAAG 4*

Q/V	ANSWER / *ANTWOORD*	MARK ALLOCATION / *PUNTETOEKENNING*
4.1	$T_6 = 11{,}50$	2 marks for / *punte vir* 11,50
4.2	Add 0,25 to the previous term to get the next term / *plus 0,25 by vorige term om volgende term te kry*	2 marks for answer / 2 *punte vir antwoord*
4.3	$T_n = 25$ $25 = 0{,}25\,n + 10$ $15 = 0{,}25\,n$ $n = 60$	1 mark for / *punt vir* $25=0{,}25\,n + 10$ 1 mark for / *punt vir* $15 = 0{,}25\,n$ 1 mark for / *punt vir* $n = 60$

QUESTION 5 / *VRAAG 5*

Q/V	ANSWER / *ANTWOORD*	MARK ALLOCATION / *PUNTETOEKENNING*
5.1.1	$C_1 = D_2 = 20^o$ Alt. < ; DE//BC *Verwisselende hoeke* DE//BC	1 for / *vir* 20^o 1 for reason / *vir rede*
5.1.2	$D_3 = 180^o - 68^o - 20^o$ Angles of triangle / *Hoeke van driehoek* = 180^o $D_3 = 92^o$	1 mark for / *punt vir* 1 mark for / *punt vir*
5.1.3	$B_1 + B_2 = D_1 = 68^o$ Corresponding / *Ooreenstemmend* <; $\angle ADC = D_1+D_2$ DE//BC $= 68^o + 20^o$ $= 88^o$ **OR/*OF*** $180° - 20° - 92° = 88°$ Angles on straight line / *Hoeke op reguit lyn*	1 mark for / *punt vir* $B1 + B2 = D_1 = 68^o$ Corresponding / *Ooreen-stemmend* <; DE//BC 1 mark for / *punt vir* $ADC = 88^o$
5.1.4.	$A = C_2 = (180^o - 88) \div 2$ $A = 46^o$ $C_3 = B_1 + B_2 + A$ Exterior angle of triangle / *Buitehoek van 'n driehoek* $= 68^o + 46^o$ $= 114^o$ **OR / *OF*** $C_1 + C_2 + C_3 = 180^o$ Angles on a straight line / *Hoeke op reguitlyn* = 180^o $C_3 = 180^o - 20^o - 46^o$ $= 114^o$	1 mark for / *punt vir* $A = 46^o$ 1 mark for / *punt vir* $C_3 = B_1 + B_2 + A$ and reason / *en rede* 1 mark for / *punt vir* $C_3 = 114^o$ **OR / *OF*** 1 mark for / *punt vir* $C_1 + C_2 + C_3 = 180^o$ Angles on a straight line / *Hoeke op 'n reguityn* = 180^o 1 mark for / *punt vir* for $C_3 = 180^o - 20^o - 46^o$ 1 mark for / *punt vir* $C_3 = 114^o$

Q/V	ANSWER / *ANTWOORD*	MARK ALLOCATION / *PUNTETOEKENNING*
5.2.	In Δ MNO and Δ PNO: MO = OP Radii of circle / *Radiusse van sirkel* MN = PN Given / *Gegee* ON = ON Common side / *Algemene newe* Δ MNO ≡ Δ PNO S;S;S	1 mark for / *punt vir* MO = OP Radius of circle / Radius van sirkel 1 mark for / *punt vir* MN = PN Given / *Gegee* 1 mark for / *punt vir* ON = ON Common side / Algemene newe 1 mark for / *punt vir* Δ MNO ≡ Δ PNO S;S;S
5.3	In Δ OPQ and / *en* Δ OSR: $O_1 = O_2$ Vert. opp < ∠P = ∠S Alt <^{e}; PQ // RS ∠Q = ∠R Alt <^{e}; PQ // RS Δ OPQ /// Δ OSR <;<;<	1 mark for / *1 punt vir* $O_1 = O_2$ Vert. opp < 1 mark for/ *1 punt vir* P = S Alt <^{e}; PQ // RS 1 mark for/ *1 punt vir* Q = R Alt <^{e}; PQ // RS 1 mark for / *punt vir* Δ OPQ /// Δ OSR <;<;<
5.4.1	$8x + 4 + 4x + 4 + x - 4 + 5x - 4 = 360^o$ Angles of quad / *Hoeke van vierhoek* = 360^o $18x = 360^o$ $x = 20^o$	1 mark for $8x + 4 + 4x + 4 + x - 4 + 5x - 4 = 360^o$ 1 mark for / *punt vir* Angles of quad / *Hoeke van vierhoek* = 360^o 1 mark for / *punt vir* $18x = 360^o$ 1 mark for / *punt vir* $x = 20^o$

Q/V	ANSWER / *ANTWOORD*	MARK ALLOCATION / *PUNTETOEKENNING*
5.4.2	$4x + 4 + 5x - 4$ $= 4(20^o) + 4 + 5(20^o) - 4$ $=80^o + 4 + 100^o - 4$ $= 180^o$ Therefore / *Dus* ST // UV Co-interior / *Mede-binnehoek* < $=180^o$ **OR / *OF*** $8x + 4 + x - 4$ $= 8(20^o) + 4 + (20^o) - 4$ $=160^o + 4 + 20^o - 4$ $= 180^o$ Therefore ST // UV Co-interior / *Mede binnehoek* < $=180^o$	1 mark for / *punt vir* $4x + 4 + 5x - 4$ 1 mark for substitution / *punt vir vervanging* 1 mark for / *punt vir* for 180^o 1 mark for / *punt vir* Therefore / *Dus* ST//UV Co-interior / *Mede binnehoek* < $=180^o$ **OR / *OF*** 1 mark for / *punt vir* $8x + 4 + x - 4$ 1 mark for substitution / *punt vir vervanging* 1 mark for / *punt vir* 180^o 1 mark for / *punt vir* Therefore / *Dus* ST//UV Co-interior / *Mede binnehoek* < $=180^o$
5.5		1 mark answer / *1 punt vir antwoord* For each side.

QUESTION 6 / *VRAAG 6*

Q/V	ANSWER / *ANTWOORD*	MARK ALLOCATION *PUNTETOEKENNING*
6.1	$4^2 - 2^2 = x^2$ $16 - 4 = x^2$ $x^2 = 12$ $x = \sqrt{12} = 3{,}46$	1 mark for/ *punt vir* $4^2 - 2^2 = x^2$ 1 mark for / *punt vir* $x^2 = 12$ 1 mark for/ *punt vir* $x = \sqrt{12}$ or 3,46
6.2	C = 2 πr = 2(3,14) 2 = 12,56 m ÷ 2 = 6,28 P = 6,28 + 1 + 5 + 1 + 2 + 2 + 3,46 + 2 + 1 + 5 + 1 = 29,74 m	1 mark for/ *punt vir* 2(3,14) 1 mark for / *punt vir* 6,28 1 mark for/ *punt vir* 3,46 1 mark for/ *punt vir* 20 + 3,46 1 mark for / *punt vir* 23,46 + 6,28 1 mark for answer/ *punt vir antwoord*
6.3	Area = (½ π × 2^2) + (5 m × 2 m) + (4 m × 2 m) + (½ × 3,46 m × 2 m) = 6,28 + 10 + 8 + 3,46 = 27,74 m^2	1 mark for/ *punt vir* (½ π × 2^2) 1 mark for/ *punt vir* (5 m × 2 m) 1 mark for/ *punt vir* (4 m × 2 m) 1 mark for/ *punt vir* (½ × 3,46 m × 2 m) 1 mark for/ *punt vir* 6,28 1 mark for/ *punt vir* 10+ 8 + 3,46 2 marks for/ *punte vir* 27,74 m^2