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GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

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

MATHEMATICS
WISKUNDE

MARKING GUIDELINES / NASIENRIGLYNE

8 pages / bladsye

**MARKING GUIDELINES /
NASIENRIGLYNE**
**Mathematics / Wiskunde
GRADE / GRAAD 9**
QUESTION / VRAAG 1

1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10
C	A	C	C	A	C	B	B	C	C

1 mark each / 1 punt elk

QUESTION / VRAAG 2

2.1	= 0,00000132 ✓A	Answer / Antwoord 1 mark/1 punt
2.2	$\frac{20}{100} \times 240$ $= R48 \quad \checkmark M$ Decreased amount / verminderde bedrag: $= R240 - R48$ $= R192 \quad \checkmark CA$ or / of $= \frac{80}{100} \times 240$ $= \frac{4}{5} \times R240 \quad \checkmark M$ $= R192 \quad \checkmark CA$	Calculation / Berekening: 1 mark / 1 punt Answer / Antwoord: 1 mark/1 punt
2.3.1	$\frac{(5x^2)^2 y^3 \times (2xy)^2}{50x^4 y^5}$ $= \frac{25x^4 y^3 \times 4x^2 y^2}{50x^4 y^5} \quad \checkmark M$ $= \frac{100x^6 y^5}{50x^4 y^5} \quad \checkmark M$ $= 2x^{6-4} y^{5-5} \quad \checkmark M$ $= 2x^2 \quad \checkmark CA$	1 mark for / 1 punt vir $25x^4 y^3 \times 4x^2 y^2$ 1 mark for / 1 punt vir $100x^6 y^5$ 1 mark for dividing / 1 punt vir deling 1 mark for answer/ 1 punt vir antwoord
2.3.2	$\frac{\sqrt[3]{x^9}}{(4x^2)^0}$ $= \frac{(x^9)^{\frac{1}{3}}}{1}$ $= x^3 \quad \checkmark CA$ OR/OF $\frac{\sqrt[3]{x^9}}{(4x^2)^0}$ $= \frac{\sqrt[3]{(x^3)^3}}{1} \quad \checkmark M$ $= x^3 \quad \checkmark CA$	1 mark for / 1 punt vir $\frac{(x^9)^{\frac{1}{3}}}{1}$ 1 mark for answer/ 1 punt vir antwoord OR/OF 1 mark for / 1 punt vir $(x^3)^3$ 1 mark for answer/ 1 punt vir antwoord

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2.3.3	$\frac{x+3}{5} - \frac{3x+2}{3}$ $= \frac{3(x+3) - 5(3x+2)}{15} \checkmark \text{M}$ $= \frac{3x+9-15x-10}{15} \checkmark \text{M}$ $= \frac{-12x-1}{15} \checkmark \text{CA}$	1 mark for LCD = 15 / <i>punt vir KGD = 15</i> 1 mark for simplification / <i>1 punt vir vereenvoudiging</i> 1 mark for answer / <i>1 punt vir antwoord</i>
		[12]

QUESTION / VRAAG 3

3.1	$36xy - 9y$ $= 9y(4x - 1) \checkmark \checkmark \text{A}$	1 mark for / <i>1 punt vir 9y</i> 1 mark for / <i>1 punt vir (4x - 1)</i>
3.2	$x^2 - 81$ $= (x - 9)(x + 9) \checkmark \checkmark \text{A}$	1 mark for / <i>1 punt vir (x - 9)</i> 1 mark for / <i>1 punt vir (x + 9)</i>
3.3	$x^2 - 2x - 3$ $= (x - 3)(x + 1) \checkmark \checkmark \text{A}$	1 mark for / <i>1 punt vir (x - 3)</i> 1 1 mark for / <i>1 punt vir (x + 1)</i>
		[6]

QUESTION / VRAAG 4

4.1	$\frac{2x-3}{2} = \frac{x+1}{6}$ $3(2x-3) = x+1 \checkmark \text{M}$ $6x-9 = x+1 \checkmark \text{M}$ $5x = 10 \checkmark \text{M}$ $x = 2 \checkmark \text{CA}$	1 mark for $\times 6$ (L.C.D) / <i>1 punt vir $\times 6$ (KGD)</i> 1 mark for simplification / <i>1 punt vir vereenvoudiging</i> 1 mark for simplify / <i>1 punt vir</i> 1 mark for answer / <i>1 punt vir antwoord</i>
4.2	$2^{x-1} = 4$ $2^{x-1} = 2^2 \checkmark \text{M}$ $\therefore x-1 = 2 \checkmark \text{M}$ $x = 3 \checkmark \text{CA}$	1 mark for 2^2 / <i>1 punt vir 2^2</i> 1 mark for $x-1 = 2$ / <i>1 punt vir $x-1 = 2$</i> 1 mark for answer / <i>1 punt vir antwoord</i>
4.3	$x^2 - 7x + 12 = 0$ $(x-3)(x-4) = 0 \checkmark \text{M}$ $x = 3 \text{ OR/OF } x = 4 \checkmark \text{CA}$	1 mark for factorising / <i>1 punt vir faktorering</i> 1 mark for answer / <i>1 punt vir antwoord</i>
		[9]

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QUESTION / VRAAG 5

5.1	$d = s \times t \checkmark \mathbf{M}$ $= 110 \text{ km/h} \times 3 \text{ h} \checkmark \mathbf{M}$ $= 330 \text{ km} \checkmark \mathbf{A}$	1 mark for formula / 1 punt vir formule 1 mark for substitution / 1 punt vir vervanging 1 mark for answer / 1 punt vir antwoord
5.2	Let / laat 10 boys / seuns = R x $Rx \times 10 = R115,50 \times 8 \checkmark \mathbf{M}$ $x = R \frac{8 \times 115,50}{10} \checkmark \mathbf{M}$ $x = R92,40 \checkmark \mathbf{CA}$	1 mark for calculation / 1 punt vir berekening 1 mark for calculation / 1 punt vir berekening 1 mark for answer / 1 punt vir antwoord
5.3	$A = P(1 + ni) \checkmark \mathbf{M}$ $R6\,200 = R5\,000(1 + n \times 0,06) \checkmark \mathbf{M}$ $\frac{6\,200}{5\,000} = 1 + 0,06n$ $1,24 - 1 = 0,06n$ $\frac{0,24}{0,06} = n$ $n = 4 \checkmark \mathbf{CA}$ OR/OF $I / ER = \frac{P \cdot r \cdot n}{100} \checkmark \mathbf{M}$ $R1\,200 = \frac{5\,000 \times 6 \times n}{100} \checkmark \mathbf{M}$ $\frac{1200}{300} = n$ $n = 4 \checkmark \mathbf{VA}$	1 mark for formula / 1 punt vir formule 1 mark for calculation / 1 punt vir berekening 1 mark for answer / 1 punt vir antwoord
5.4	$A = P(1 + i)^n \checkmark \mathbf{M}$ $= R15\,000(1 + 0,06)^5 \checkmark \mathbf{M}$ $= R\,20\,073,38 \checkmark \mathbf{CA}$ OR / OF $A = P \left(1 + \frac{r}{100}\right)^n \checkmark \mathbf{M}$ $= R15\,000 \left(1 + \frac{6}{100}\right)^5 \checkmark \mathbf{M}$ $= R\,20\,073,38 \checkmark \mathbf{CA}$	1 mark for formula / 1 punt vir formule 1 mark for substitution / 1 punt vir vervanging 1 mark for answer / 1 punt vir antwoord
		[12]

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QUESTION / VRAAG 6

6.1	$c = -3$ ✓A $y = mx + c$ $0 = m(4) - 3$ $4m = 3$ $m = \frac{3}{4}$ ✓A $\therefore y = \frac{3}{4}x - 3$ ✓A	1 mark for $c = -3$ / 1 punt vir $c = -3$ 1 mark for substitution into correct formula / 1 punt vir vervanging in korrekte formule 1 mark for $m = \frac{3}{4}$ / 1 punt vir $m = \frac{3}{4}$ 1 mark for answer / 1 punt vir antwoord
6.2	$m_1 \times m_2 = -1$ $\frac{3}{4} \times m_2 = -1$ ✓M/CA $m_2 = -\frac{4}{3}$ ✓CA	1 mark for substitution into correct formula/ 1 punt vir vervanging in korrekte formule 1 mark for answer / 1 punt vir antwoord
		[6]

QUESTION / VRAAG 7

7.1.1	20 learners ✓A	1 mark for answer / 1 punt vir antwoord
7.1.2	$\frac{10 + 10 + 11 + 11 + 18 + 22 + 23 + 25 + 25 + 26 + 28 + 29 + 30 + 31 + 32 + 33 + 33 + 33 + 34 + 35}{20}$ $= \frac{499}{20}$ ✓M $= 24,95$ ✓A	1 mark for the sum divided by 20 / 1 punt vir die som gedeel met 20 1 mark for answer / 1 punt vir antwoord
7.1.3	33 ✓A	1 mark for answer / 1 punt vir antwoord
7.1.4	$\frac{26+28}{2}$ ✓M $= 27$ ✓A	1 mark for $\frac{26+28}{2}$ / 1 punt vir $\frac{26+28}{2}$ 1 mark for answer / 1 punt vir antwoord
7.2.1	$P(A) = \frac{1}{6}$ ✓A	1 mark for answer / 1 punt vir antwoord
7.2.2	$P(A) = \frac{1}{5}$ ✓A	1 mark for answer / 1 punt vir antwoord
		[8]

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QUESTION / VRAAG 8

8.1	Statement / Bewering	Reason / Rede	1 mark for statement / <i>punt vir bewering</i> 1 mark for reason / <i>punt vir rede</i> 1 mark for answer / <i>punt vir antwoord</i> 1 mark for statement / <i>punt vir bewering</i> 1 mark for reason / <i>punt vir rede</i>
	$x + 70^\circ = 180^\circ \checkmark \mathbf{A}$	co-interior $\angle s$ & $AC \parallel DF$ / $\checkmark \mathbf{A}$ <i>ko-binne $\angle e$ & $AC \parallel DF$</i>	
	$x = 110^\circ \checkmark \mathbf{A}$		
	$y = 40^\circ \checkmark \mathbf{A}$	alt. $\angle s$ & $AC \parallel DF$ / <i>verw. $\angle e$ & $AC \parallel DF$</i> $\checkmark \mathbf{A}$	
8.2	Statement / Bewering	Reason / Rede	1 mark for statement and reason / <i>punt vir bewering en rede</i> 1 mark for $\hat{D}_2 = 60^\circ$ / <i>punt vir $\hat{D}_2 = 60^\circ$</i> 1 mark for reason / <i>punt vir rede</i> 1 mark for statement / <i>punt vir bewering</i> 1 mark for reason / <i>punt vir rede</i> 1 mark for $\hat{E} = 60^\circ$ / <i>punt vir $\hat{E} = 60^\circ$</i>
	$\hat{D}_1 + \hat{D}_2 = 180^\circ$	Suppl. $\angle s$ on a str. line / <i>Gegee. $\angle s$ op reguit lyn</i> $\checkmark \mathbf{A}$	
	$\hat{D}_1 = 60^\circ \checkmark \mathbf{A}$		
	$\hat{D}_1 = \hat{F}$	$\angle s$ opp. equal sides / <i>$\angle s$ op teenoorgestelde gelyke sye</i> $\checkmark \mathbf{A}$	
	$\hat{E} + \hat{F} + \hat{D}_1 = 180^\circ \checkmark \mathbf{A}$	sum of $\angle s$ of Δ / <i>som van binne $\angle e$ van Δ</i> $\checkmark \mathbf{A}$	
	$\therefore \hat{E} = 60^\circ \checkmark \mathbf{A}$		
8.3	$\angle \angle s \checkmark \mathbf{A}$		1 mark for answer / <i>punt vir antwoord</i>
8.4	Statement / Bewering	Reason / Rede	1 for statement and reason / <i>bewering en rede</i> 1 for statement and reason / <i>bewering en rede</i> 1 for statement and reason / <i>bewering en rede</i> 1 for reason / <i>rede</i>
	In ΔATB and ΔCTD		
	$AT = CT$	Given diagonals bisect each other / <i>gegee hoeklyne halveer mekaar</i> $\checkmark \mathbf{A}$	
	$\hat{T}_1 = \hat{T}_2$	vert. opp $\angle s$ / $\checkmark \mathbf{A}$ <i>regoorst. $\angle e$</i>	
	$AT = CT$	Given diagonals bisect each other / <i>gegee hoeklyne halveer mekaar</i> $\checkmark \mathbf{A}$	
	$\therefore \Delta ATB \equiv \Delta CTD$	<i>s</i> $\angle s \checkmark \mathbf{A}$	

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8.5.1	<table><tr><th>Statement / <i>Bewering</i></th><th>Reason / <i>Rede</i></th></tr><tr><td>$\triangle ABD$ and $\triangle CBA$</td><td></td></tr><tr><td>$\hat{A}_1 = \hat{C}$</td><td>given / <i>gegee</i> ✓</td></tr><tr><td>$\hat{B} = \hat{B}$</td><td>common / <i>algemeen</i> ✓</td></tr><tr><td>$\hat{D}_1 = \hat{A}$</td><td>given / <i>gegee</i> ✓ OR/OF both = 90°/<i>altwee</i> = 90°</td></tr><tr><td>$\triangle ABD \equiv \triangle CBA$</td><td>$\angle\angle\angle$✓</td></tr></table>	Statement / <i>Bewering</i>	Reason / <i>Rede</i>	$\triangle ABD$ and $\triangle CBA$		$\hat{A}_1 = \hat{C}$	given / <i>gegee</i> ✓	$\hat{B} = \hat{B}$	common / <i>algemeen</i> ✓	$\hat{D}_1 = \hat{A}$	given / <i>gegee</i> ✓ OR/OF both = 90° / <i>altwee</i> = 90°	$\triangle ABD \equiv \triangle CBA$	$\angle\angle\angle$ ✓	1 mark for statement and reason / <i>punt vir bewering en rede</i> 1 mark for statement and reason / <i>punt vir bewering en rede</i> 1 mark for statement and reason / <i>punt vir bewering en rede</i> 1 for statement and reason / <i>punt vir bewering en rede</i>
Statement / <i>Bewering</i>	Reason / <i>Rede</i>													
$\triangle ABD$ and $\triangle CBA$														
$\hat{A}_1 = \hat{C}$	given / <i>gegee</i> ✓													
$\hat{B} = \hat{B}$	common / <i>algemeen</i> ✓													
$\hat{D}_1 = \hat{A}$	given / <i>gegee</i> ✓ OR/OF both = 90° / <i>altwee</i> = 90°													
$\triangle ABD \equiv \triangle CBA$	$\angle\angle\angle$ ✓													
8.5.2	$\frac{AB}{CB} = \frac{BD}{BA} = \frac{AD}{CA} \checkmark$ $\frac{AB}{CB} = \frac{BD}{BA}$ $AB^2 = BD \times CB$ $AB^2 = 49\text{ cm} \times 9\text{ cm} \checkmark$ $AB^2 = 441\text{ cm}^2$ $AB = 21\text{ cm} \checkmark$	1 mark for statement / <i>punt vir bewering</i> 1 mark for substitution / <i>punt vir vervanging</i> 1 mark for answer / <i>punt vir antwoord</i>												
8.6.1		1 mark for construction / <i>punt vir konstruksie</i> 1 mark for labelling / <i>punt vir benoeming</i>												
8.6.2	$\angle ABC = 60^\circ \checkmark$	1 mark for answer / <i>punt vir antwoord</i>												
8.7.1	$A'(-4; -3) \checkmark$	1 mark for answer / <i>punt vir antwoord</i>												
8.7.2	$A''(4; 3) \checkmark$	1 mark for answer / <i>punt vir antwoord</i>												
8.7.3	$A'''(4; -3) \checkmark$	1 mark for answer / <i>punt vir antwoord</i>												
		[29]												

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QUESTION / VRAAG 9

9.1	$c = 2\pi r \checkmark$ $c = 2 \times 3,14 \times 7 \text{ cm}$ $c = 43,96 \text{ cm} \checkmark$ $SA = c \times h \checkmark$ $= 43,96 \times 16 \text{ cm}^2$ $= 703,36 \text{ cm}^2 \checkmark$	1 mark for formula / <i>punt vir formule</i> 1 mark for answer / <i>punt vir antwoord</i> 1 mark for formula / <i>punt vir formule</i> 1 mark for answer / <i>punt vir antwoord</i>
9.2	$V = \pi r^2 \times h \checkmark$ $= 3,14 \times (7)^2 \times 16 \text{ cm}^3 \checkmark$ $= 2\,461,76 \text{ cm}^3 \checkmark$	1 mark for formula / <i>punt vir formule</i> 1 mark for substitution / <i>punt vervanging</i> 1 mark for answer / <i>punt vir antwoord</i>
		[6]
	TOTAL / TOTAAL	[100]