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GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION
GAUTENGSE DEPARTEMENT VAN ONDERWYS

PROVINCIAL EXAMINATION
PROVINSIALE EKSAMEN

NOVEMBER 2019

GRADE / *GRAAD* 9

MATHEMATICS
WISKUNDE

MARKING GUIDELINES / *NASIENRIGLYNE*

9 pages / *bladsye*

QUESTION / *VRAAG* 1

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

QUESTION / *VRAAG* 2

2.1	$\frac{36}{100} : \frac{84}{100}$ $\frac{36}{84} \div \frac{12}{12}$ **or/ *of*** $\frac{36}{12} : \frac{84}{12}$✓ $\frac{3}{7}$ $3 : 7$✓**A**		Simplify / *Vereenvoudig:* 1 mark / *1punt* Answer / *Antwoord* 1 mark /1 *punt*
2.2	$= -4\left(-\frac{1}{2}\right)^2$ ✓ $= -4\left(\frac{1}{4}\right)$ $= -1$ ✓**A**		Substitution / *Vervanging:* 1mark */ 1 punt* Answer / *Antwoord:* 1 mark / *1 punt*
2.3	2.3.1	$16 - 4^2$ $= 16 - 16$✓**CA** $= 0$✓ **A**	Simplify / *Vereenvoudig:* 1 mark /*1 punt* Answer / *Antwoord* 1 mark /*1 punt*
	2.3.2	$2x^2 - x - 15$✓ $-(\boldsymbol{x^2 - 2x + 1})$✓ $= 2x^2 - x^2 - x + 2x - 15 - 1$✓ $= x^2 + x - 16$✓ **CA**	Multiply ( )s / *Vermeningvuldig* ( )s /1 mark each /*1 punt elk* Simplify / *Vereenvoudig:*1 mark /*1 punt* Answer / *Antwoord*: 1 mark /*1 punt*
			[10]

QUESTION / *VRAAG* 3

3.1	$= 5xy$✓$(12x - 5y + 1)$✓	$5xy$:1 mark / *1 punt* $(12x - 5y + 1)$:1 mark / *1 punt*
3.2	$= (k - 8)(k + 8)$ ✓✓**A**	$(k - 8)$: 1 mark / *1 punt* $(k + 8)$: 1 mark / *1 punt*
3.3	$x^2 + 7x - 18$ $= (x - 2)(x + 9)$ ✓✓**A**	$(x - 2)$ 1 mark / *1 punt* $(x + 9)$ 1 mark / *1 punt*
3.4	$= a(x - y) + 4(x - y)$✓**A** $= (x - y)(a + 4)$✓✓**A**	Grouping and common factors / *Groepering en gemeenskaplike faktore*: 1 mark / *1 punt* $(x - y)$ 1 mark / *1 punt* $(a + 4)$ 1 mark / *1 punt*
		[9]

QUESTION / *VRAAG* 4

4.1	$3x = 6$✓**M** $x = 2$✓**CA**	1 mark for simplification 1 mark / *1 punt vir vereenvoudiging* 1 mark for answer / *1 punt vir antwoord*
4.2	$x^3 = \left(\frac{1}{2}\right)^3$ ✓**M** $\therefore x = \frac{1}{2}$ ✓**CA**	1 mark for writing $\frac{1}{8}$ as $\left(\frac{1}{2}\right)^3$ / *1 punt vir skrywe* $\frac{1}{8}$ *as* $\left(\frac{1}{2}\right)^3$ / 1 mark for answer / *1 punt vir antwoord*
4.3	$(x - 5)(x - 2) = 0$✓**M** $x = 5$ **or /*of*** $x = 2$✓**CA**	1 mark for factorising / *1 punt vir faktorisering* 1 mark for answer / *1 punt vir antwoord*
		[6]

QUESTION / *VRAAG* 5

5.1	The price of 1 chicken / *Die prys van 1 hoender* $= Rx$ The price of 1 turkey / *Die prys van 1 kalkoen* $= R5x$. ✓**M** $\therefore$ 50 chickens / hoenders = R50 *x* and / *en* 20 turkeys / *kalkoene* $= R100x$✓**M** $50x + 100x = 1200$✓**M** $150x = R1200$ $x = \frac{1200}{150} = R8$ ✓**M** $\therefore$ 1 turkey / *kalkoen* $= 5 \times R8 = R40$✓**CA**	1 mark for reasoning / *1 punt vir redenasie* 1 mark for reasoning / *1 punt vir redenasie* 1 mark for statement / *1 punt vir stelling* 1 mark for calculation / *1 punt vir bewerking* 1 mark for answer / *1 punt vir antwoord*
5.2	A $= P(1 + ni)$ **or / *of*** $P = \frac{A}{(1+ni)}$ ✓ **M** $15000 = P(1 + 0{,}07 \times 6)$ **or / *of*** $P = \frac{15000}{(1+0{,}07\times6)}$ ✓**M** $15000 = P(1{,}42)$ **or / *of*** $P = \frac{15000}{(1{,}42)}$ $P = R10\,536{,}38$ ✓**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*
5.3	D = speed / *spoed* × time / *tyd*✓ **M** $= 80 \times 3$✓ **M** $= 240$ km✓ **M** Time$= \frac{distance}{speed}$ / $\frac{afstand}{spoed}$ ✓ **M** $= \frac{240}{60}$✓ **CA** $= 4$ hrs / *ure*✓ **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* 1 mark for formula /*1 punt vir formule* 1 mark for substitution / *1 punt vir vervanging* 1 mark for answer / *1 punt vir antwoord*
		[14]

QUESTION / *VRAAG* 6

6.1	$y = mx + c$ $c = 6$ ✓**A** $m = \frac{y_2 - y_1}{x_2 - x_1}$ $m = \frac{6-0}{0-(-1)}$ ✓**CA** $m = 6$ ✓**CA** $\therefore$ Eqn of/ $Vglk\ van\ f: y = 6x + 6$ ✓**CA** **or / of** **substitute / *vervang*** $c = 6, x = -1$ and / *en* $y = 0$ into / *in* $y = mx + c$ $0 = m(-1) + 6$ ✓✓**M** $m = 6$ ✓**CA** $\therefore$ Eqn of / $Vglk\ van\ f: y = 6x + 6$ ✓**CA**	1 mark for $c = 6$ / *1 punt vir c* 6 1 mark for substitution into gradient formula *1 punt vir vervanging in gradiënt formule* 1 mark for $m = 6$ / *1 punt vir* $m = 6$ 1 mark for answer / *1 punt vir antwoord* **or / *of*** 1 mark for substitution of $c = 6$ / *1 punt vir vervanging van* $c = 6$ 1 mark for substitution of $(-1; 0)$ into $y = mx + c$ / *1 punt vir vervanging* $(-1; 0)$ *in* $y = mx + c$ 1 mark for $m = 6$ / *1 punt vir* $m = 6$ 1 mark for answer / *1 punt vir antwoord*
6.2	$y = -2$ ✓**A**	1 mark for answer / *1 punt vir antwoord*
		[5]

QUESTION / *VRAAG* 7

7.1.1	<table><tr><th>Stem / *Stam*</th><th>Leaves / *Blare*</th></tr><tr><td>1</td><td>2✓</td></tr><tr><td>2</td><td>1 3✓</td></tr><tr><td>3</td><td>1 5 5 7✓</td></tr><tr><td>4</td><td>2 3 6 ✓</td></tr><tr><td>5</td><td>4 5 7✓</td></tr></table>	1 mark for each correct row / *1 punt vir elke korrekte ry*
7.1.2	$Range = 57 - 12$ / $Omvang = 57 - 12$ $R = 45$✓**A**	1 mark for answer / *1 punt vir antwoord*
7.1.3	$50\% = \frac{30}{60}$ $\therefore$ 10 learners / *leerders*✓**A**	1 mark for answer / *1 punt vir antwoord*
7.2.1	$P(R) = \frac{5}{15} = \frac{1}{3}$ ✓ **A**	1 mark for answer / *1 punt vir antwoord*
7.2.2	$P(G \text{ or/}of\ B) = \frac{3}{15} + \frac{7}{15}$ ✓ $P(G \text{ or/}of\ B) = \frac{2}{3}$ ✓	1 mark for $\frac{3}{15} + \frac{7}{15}$ / *1 punt vir* $\frac{3}{15} + \frac{7}{15}$ 1 mark for answer / *1 punt vir antwoord*
7.2.3	$P(Y) = 0$ ✓**A**	1 mark for answer / *1 punt vir antwoord*
		[11]

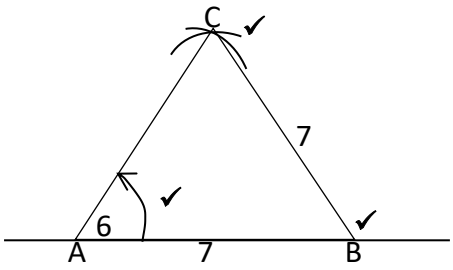
QUESTION / *VRAAG* 8

<table>
<tr><td>8.1.1</td><td>
<table>
<tr><th>Statement / Bewering</th><th>Reason / Rede</th></tr>
<tr><td>$65° + 45° + b = 180°$ ✓M

$b = 70°$ ✓CA</td><td>$\angle s$ on a str line/ $\angle e$ op reguit lyn✓A</td></tr>
</table>
</td><td>1 mark for statement / 1 punt vir bewering
1 mark for reason / 1 punt vir rede
1 mark for answer / 1 punt vir antwoord</td></tr>
<tr><td>8.1.2</td><td>
<table>
<tr><th>Statement / Bewering</th><th>Reason / Rede</th></tr>
<tr><td>$70° + a + 40° = 180°$ ✓M

$a = 70°$ ✓CA</td><td>sum int $\angle s$ of ΔACE /som binne $\angle e$ van ΔACE✓A</td></tr>
</table>
</td><td>1 mark for statement / 1 punt vir bewering
1 mark for reason / 1 punt vir rede
1 mark for answer / 1 punt vir antwoord</td></tr>
<tr><td>8.1.3</td><td>
<table>
<tr><th>Statement / Bewering</th><th>Reason / Rede</th></tr>
<tr><td>ΔBCD is an iscosceles triangle / gelykbenige driehoek ✓A</td><td>$\angle s$ opposite equal sides are equal / teenoorstaande gelykesye is gelyk ✓A</td></tr>
</table>
</td><td>1 mark for statement / punt vir bewering
1 mark for reason / punt vir rede</td></tr>
<tr><td>8.2</td><td>
<table>
<tr><th>Statement / Bewering</th><th>Reason / Rede</th></tr>
<tr><td>In ΔABC and ΔCDA:</td><td></td></tr>
<tr><td>$AB =$ DC</td><td>Given / Gegee ✓</td></tr>
<tr><td>$AC =$ AC</td><td>Common side / Gemeenskaplike sy✓</td></tr>
<tr><td>$\hat{A}_1 = \hat{C}_1$✓</td><td>alt $\angle s$ and AB∥DC / verw. $\angle e$ en AB∥DC ✓</td></tr>
<tr><td>ΔABC ≡ ΔCDA</td><td>$s\angle s$✓</td></tr>
</table>
</td><td>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
1 mark for statement and reason / punt vir bewering en rede</td></tr>
</table>

8.3	**Statement / *Bewering*** | **Reason / *Rede*** In ΔCFB and ΔDFE: | $\hat{C} = \hat{D} = 40°$ | given / *gegee* ✓**A** $\hat{F}_1 = \hat{F}_2$ | vert. opp. $\angle s$ ✓ $\hat{B}_2 = \hat{E}_2$ | sum int $\angle s$ of Δ / *som binne* $\angle e$ *van* Δ ✓**A** ∴ Δ CFB ||| ΔDFE | $\angle\angle\angle$ ✓	1 mark for statement and reason / *1 punt vir bewering en rede* 1 mark for statement and reason / *1 punt vir bewering en rede* 1 mark for statement and reason / *1 punt vir bewering en rede* 1 mark for reason / *1 punt vir rede*

8.4	8.4.1	Construction / *Konstruksie*  	1 mark for correct labeling of triangle / *1 punt vir korrekte benoeming van driehoek* 1 mark for accurate measurement of sides / *1 punt vir akkurate meting van sye* 1 mark for accurate measurement of $\hat{A} = 65°$ angle / *1 punt vir akkurate meting van* $\hat{A} = 65°$
	8.4.2	$A\hat{B}C = 50°$✓**CA**	1 mark for accurate measurement of angle / *1 punt vir akkurate meting van hoek*
8.5	$H'(0\ ;\ 2)$ ✓ **A**		1 mark for each co-ordinate / *1 punt vir elk korekte kordinate*
			[22]

QUESTION / *VRAAG* 9

<table>
<tr><td>9.1</td><td colspan="2"><table>
<tr><th>Statement / Bewering</th><th>Reason / Rede</th></tr>
<tr><td>In ΔYTZ</td><td></td></tr>
<tr><td>YT= 13✓A</td><td>Opposite ∠ of a rectangle / Teenoorgestelde van 'n reghoek</td></tr>
<tr><td>$YZ^2 = YT^2 - TZ^2$</td><td>Theorem of Pythagoras / Stelling van Pythagoras</td></tr>
<tr><td>$= 13^2 - 5^2$✓M</td><td></td></tr>
<tr><td>$= 169 - 25$</td><td></td></tr>
<tr><td>$= 144$ ✓CA</td><td></td></tr>
<tr><td>$YZ = 12$✓CA</td><td></td></tr>
</table></td><td>1 mark for YT= 13 /1 punt vir YT= 13
1 mark for $YZ^2 = YT^2 - TZ^2$ / 1 punt vir $YZ^2 = YT^2 - TZ^2$ and substitution / en substitusie
1 mark for $YZ^2 = 144$ /1 punt vir antwoord $YZ^2 = 144$
1 mark for answer / 1 punt vir antwoord</td></tr>
<tr><td>9.2</td><td>9.2.1</td><td>$Area\ ABCD = AB \times BC$ or / of $AD \times DC$ ✓</td><td>1 mark for formula / punt vir formule</td></tr>
<tr><td></td><td>9.2.2</td><td>$Area\ \Delta DEC = \frac{DC \times EF}{2}$ or / of $\frac{1}{2} \times DC \times EF$ ✓</td><td>1 mark for formula / punt formule</td></tr>
<tr><td></td><td>9.2.3</td><td>$Area\ \|^m\ CDEG = DC \times EF$ or / of $EG \times BC$✓</td><td>1 mark for formula / punt formule</td></tr>
<tr><td></td><td>9.2.4</td><td>Area of / van AECD = $\frac{EF(AE + DC)}{2}$✓</td><td>1 mark for formula / punt formule</td></tr>
<tr><td>9.3</td><td colspan="2">$SA = 2\pi r^2 + 2\pi r \times H$✓
$= 2\left(\frac{22}{7}\right)(7)^2 + 2\left(\frac{22}{7}\right)(7) \times 12$✓
$= 308\text{cm}^2 + 528\text{cm}^2$ ✓
$SA = 836\ cm^2$✓CA
or / of
$SA = 2\pi r(r + h)$✓
$= 2\left(\frac{22}{7}\right)(7)(19)cm^2$✓✓
$SA = 836\ cm^2$✓CA</td><td>1 mark for formula / punt formule
1 mark for correct substitution / 1 punt vir korrekte vervanging
1 mark for calculation / 1 punt vir bewerking
1 mark for answer / 1 punt vir antwoord.</td></tr>
<tr><td></td><td colspan="2"></td><td>[13]</td></tr>
<tr><td></td><td colspan="2">TOTAL / TOTAAL</td><td>[100]</td></tr>
</table>