GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

# PROVINCIAL EXAMINATION/

# *PROVINSIALE EKSAMEN*

# JUNE/*JUNIE* 2022

# GRADE/*GRAAD* 9

# MARKING GUIDELINES/

# *NASIENRIGLYNE*

**MATHEMATICS/*WISKUNDE***

**9 pages/*bladsye***

**SECTION/*AFDELING* A**

**QUESTION/*VRAAG* 1**

| 1.1 | 1.2 | 1.3 | 1.4 | 1.5 |
|---|---|---|---|---|
| C✓**A** | D✓**A** | D✓ **A** | B✓**A** | A✓**A** |

**[5]**

**SECTION/*AFDELING* B**

**QUESTION/*VRAAG* 2**

| | | | | |
|---|---|---|---|---|
| 2.1 | 2.1.1 | 15✓**A** | 1 mark for the HCF.<br>*1 punt vir die GGF.* | (1) |
| | | | | |
| | 2.1.2 | 300✓**A** | 1 mark for the LCM.<br>*1 punt vir die KGV.* | (1) |
| | | | | |
| 2.2 | $\sqrt[3]{15}$ is between/*tussen* 2 and/*en* 3✓✓**A** | | 1 mark for the minimum value 2./*1 punt vir die minimum waarde 2.*<br>1 mark for the maximum value 3./*1 punt vir die maksimum waarde 3.* | (2) |
| | | | | |
| 2.3 | Irrational/*Irrasionaal*✓**A** | | 1 mark for the answer.<br>*1 punt vir die antwoord.* | (1) |
| | | | | |
| 2.4 | Table C/*Tabel C*✓**A**<br><br>**Possible justification/*Moontlike redes***<br>$\frac{x}{y} = a\ constant/'n\ konstante$✓✓**A**<br>**OR/*OF***<br>As the values of $x$ increase, the values of $y$ also increase in the same proportion./*Soos die waardes van $x$ toeneem, neem die waardes van $y$ ook toe in dieselfde verhouding proporsie.* ✓✓**A**<br>**OR/*OF***<br>As the values of $x$ decrease, the values of $y$ also decrease in the same proportion./*Soos daar 'n afname in die waarde van $x$ is, is daar ook 'n afname in die waarde van $y$ in dieselfde verhouding/proporsie.* ✓✓**A** | | 1 mark for correct table chosen.<br>*1 punt vir die korrekte tabel gekies.*<br>2 marks for correct justification.<br>*2 punte vir die korrekte rede.*<br><br>(Award only 1 mark for justification if learner did not mention "**same proportion**" or any explanation to that effect.)<br>*/(Ken slegs 1 punt toe in gevalle waar leerder nie **dieselfde verhouding**/**proporsie** of soortgelyke verduideliking gee nie.)* | (3) |

Commented [AN1]:

| | | | |
|---|---|---|---|
| 2.5 | Sandile fills $\frac{1}{6}$ of the tank in 1 hour.<br>*Sandile maak* $\frac{1}{6}$ *van die tenk vol in 1 uur.* ✓**M**<br>Jacob fills $\frac{1}{12}$ of the tank in 1 hour<br>*Jacob maak* $\frac{1}{12}$ *van die tenk vol in 1 uur.* ✓**M**<br><br>Together they fill $\frac{1}{6}+\frac{1}{12}$ of the tank in 1 hour.<br>*Saam maak hulle* $\frac{1}{6}+\frac{1}{12}$ *van die tenk vol in 1 uur.*<br>$\frac{1}{6}+\frac{1}{12}$<br>$=\frac{2}{12}+\frac{1}{12}$<br>$=\frac{3}{12}$<br>$=\frac{1}{4}$<br>∴ Together they fill $\frac{1}{4}$ of the tank in 1 hour.<br>∴ $Saam\ maak\ hulle\ \frac{1}{4}\ van\ die\ tenk\ vol\ in\ 1\ uur.$ ✓**A**<br>∴ It takes them 4 hours to fill the tank working together.<br>∴ $Saam\ neem\ dit\ hulle\ 4\ uur\ om\ die\ tenk\ vol\ te\ maak$ ✓**CA** | 1 mark for the rate:<br>$\frac{1}{6}of\ the\ tank\ in\ 1\ hour$<br>*1 punt vir die koers:*<br>$\frac{1}{6}$ *van die tenk in 1 uur*<br><br>1 mark for the rate:<br>$\frac{1}{12}of\ the\ tank\ in\ 1\ hour$<br>*1 punt vir die koers:*<br>$\frac{1}{12}$ *van die tenk in 1 uur*<br><br>1 mark for adding the rates to get $\frac{1}{4}$.<br>*1 punt vir die som van die koerse* $=\frac{1}{4}$.<br><br>1 mark for the answer (4 hours).<br>*1 punt vir die antwoord (4 uur).*<br><br>**Consider alternative mathematically correct responses which lead to the correct answer.**<br>***Oorweeg alternatiewe, wiskundig korrekte metodes wat lei na die regte antwoord.*** | (4) |
| | | | **[12]** |

**QUESTION/*VRAAG* 3**

| | | | | |
|---|---|---|---|---|
| 3.1 | Integers/*Heelgetalle*✓**A** | | 1 mark for answer.<br>*1 punt vir die antwoord.* | (1) |
| | | | | |
| 3.2 | | | 1 mark for each correct answer.<br>*1 punt vir elke korrekte antwoord.* | (4) |
| | | | | |
| 3.3 | 3.3.1 | $(5)(-2)^2 - 15 \div 3$<br>$= 5 \times 4 - 5$✓**M**<br>$= 20 - 5$✓**M**<br>$= 15$✓**CA** | 1 mark for squaring and dividing.<br>*1 punt vir kwadraat en deling.*<br>1 mark for multiplication.<br>*1 punt vir vermenigvuldiging.*<br>1 mark for answer.<br>*1 punt vir antwoord.* | (3) |
| | | | | |
| | 3.3.2 | $\frac{2-(-4)-2(1-4)}{1-4}$<br>$= \frac{2+4-2(-3)}{-3}$✓**M**<br>$= \frac{12}{-3}$✓**M**<br>$= -4$✓**CA** | 1 mark for simplifying numerator and denominator.<br>*1 punt vir vereenvoudiging van teller en noemer.*<br>1 mark for addition and multiplication.<br>*1 punt vir optelling en vermenigvuldiging.*<br>1 mark for answer.<br>*1 punt vir antwoord.* | (3) |
| | | | | **[11]** |

**No. *Nr.***

| | Incorrect Statement *Verkeerde Stelling* | Correct Statement *Korrekte Stelling* |
|---|---|---|
| 3.2.1 | $\sqrt[3]{-64} = -8$ | $\sqrt[3]{-64} = -4$✓**A** |
| 3.2.2 | $-4 - (-6) = -10$ | $-4 - (-6) = 2$✓**A** |
| 3.2.3 | $\sqrt{-9} = \pm 3$ | $\sqrt{-9}$ is non-real/ $\sqrt{-9}$ *is nie-reël* ✓**A** |
| 3.2.4 | $(-5)^2 = -25$ | $(-5)^2 = 25$✓**A** |

**QUESTION/*VRAAG* 4**

| | | | | |
|---|---|---|---|---|
| 4.1 | | The exponent tells us how many of the same factors there are in a product of 25.<br>*Die eksponent sê vir ons hoeveel van dieselfde faktore (basis) daar in 'n produk van 25 is.* ✓**A** | 1 mark per answer.<br>*1 punt vir antwoord.*<br>Accept any explanation to that effect.<br>*Aanvaar enige soortgelyke antwoord.* | (1) |
| | | | | |
| 4.2 | | $7^5$✓**A** | 1 mark for answer.<br>*1 punt vir antwoord.* | (1) |
| | | | | |
| 4.3 | 4.3.1 | $3x^{-2}$<br>$= \frac{3}{x^2}$ ✓**A** | 1 mark for answer.<br>*1 punt vir antwoord.* | (1) |
| | | | | |
| | 4.3.2 | $\frac{2}{5^{-2}}$<br>$= 2 \times 5^2$ ✓**A** | 1 mark for answer.<br>*1 punt vir antwoord.* | (1) |
| | | | | |
| 4.4 | 4.4.1 | $\frac{(-5wz)^2(-2w^2z)}{50w^{-1}z}$<br>$= \frac{25w^2z^2.-2w^2z}{50w^{-1}z}$✓**M**<br>$= \frac{-50w^4z^3}{50w^{-1}z}$✓**M**<br>$= -w^{4-(-1)}z^{3-1}$✓**M**<br>$= -w^5z^2$✓**CA** | 1 mark for raising the product in brackets to the power 2.<br>*1 punt vir verheffing van die produk in hakies tot die 2de mag.*<br><br>1 mark for product law application.<br>*1 punt vir toepassing van die produkreël.*<br><br>1 mark for quotient law application.<br>*1 punt vir toepassing van die kwosiëntreël.*<br><br>1 mark for the answer.<br>*1 punt vir die antwoord.* | (4) |
| | | | | |

| | | | | |
|---|---|---|---|---|
| | 4.4.2 | $\frac{81^{x+1}.5^{2x-2}}{3^{4x}.25^{x}}$<br><br>$=\frac{(3^4)^{x+1}.5^{2x-2}}{3^{4x}.(5^2)^{x}}$ ✓**M**<br><br>$=\frac{3^{4x+4}.5^{2x-2}}{3^{4x}.5^{2x}}$ ✓**M**<br><br>$=3^{4x+4-4x}.5^{2x-2-2x}$<br><br>$=3^4.5^{-2}$ ✓✓**M**<br><br>$=\frac{81}{25}$ ✓**CA** | 1 mark for prime factorising of 81 and 25.<br>*1 punt vir priemfaktorisering van 81 en 25.*<br><br>1 mark for multiplying a power with a power in numerator and denominator.<br>*1 punt vir vermenigvuldiging van 'n mag met 'n mag in die teller en noemer.*<br><br>1 mark for application of quotient rule for each base.<br>*1 punt vir toepassing van die kwosiëntreël vir elke basis.*<br><br>1 mark for the answer.<br>*1 punt vir die antwoord.* | (5) |
| | | | | **[13]** |

**QUESTION/*VRAAG* 5**

| | | | | |
|---|---|---|---|---|
| 5.1 | 5.1.1 | <table><tr><td>**Position of diagram** ***Posisie van diagram***</td><td>**1**</td><td>**2**</td><td>**3**</td><td>**4**</td><td>**5**</td></tr><tr><td>**Number of points of intersection** ***Aantal snypunte***</td><td>**3**</td><td>**12**</td><td>**27**</td><td>48✓**A**</td><td>75✓**A**</td></tr></table> | 1 mark per answer.<br>*1 punt per antwoord.* | (2) |
| | | | | |
| | 5.1.2 | The position is squared and thereafter multiplied by three.<br>*Die posisie word gekwadreer en daarna met drie vermenigvuldig.* ✓✓**A** | 2 marks for answer.<br>*2 punte vir antwoord.*<br>**Consider alternative responses which mean the same.**<br>***Oorweeg alternatiewe verduidelikings met dieselfde betekenis.*** | (2) |
| | | | | |
| 5.2 | Pattern of fifth row: 25; 31; 37 ...<br>*Patroon vir 5de ry: 25; 31; 37 ...*<br>$T_1: 6(1) + \_\_\_\_\_ = 25$<br>$T_1: 6(1) + \mathbf{19} = 25$<br>$T_2: 6(2) + \_\_\_\_\_ = 31$<br>$T_2: 6(2) + \mathbf{19} = 31$<br>$T_3: 6(3) + \_\_\_\_\_ = 37$<br>$T_3: 6(3) + \mathbf{19} = 37$<br>$\therefore T_n = 6n + 19$✓✓**A**<br>$T_{100} = 6(100) + 19$<br>$= 600 + 19$<br>$= 619$✓**A** | | 1 mark for $6n$.<br>*1 punt vir $6n$.*<br>1 mark for 19.<br>*1 punt vir 19.*<br>1 mark for 619.<br>*1 punt vir 619.* | (3) |
| | | | | **[7]** |

**QUESTION/*VRAAG* 6**

| | | | | |
|---|---|---|---|---|
| 6.1 | Binomial/*Binomiaal/Twee-term* ✓**A** | | 1 mark for answer.<br>*1 punt vir antwoord.* | (1) |
| | | | | |
| 6.2 | variables/*veranderlikes*✓**A** **OR/*OF***<br>unknowns/*onbekendes* | | 1 mark for answer.<br>*1 punt vir antwoord.* | (1) |
| | | | | |
| 6.3 | 6.3.1 | $\sqrt{9x^4y^2}$<br>$= 3x^2y$✓**A** | 1 mark for answer.<br>*1 punt vir antwoord.* | (1) |
| | | | | |
| | 6.3.2 | $(x+5)(x-3)$<br>$= x^2 - 3x + 5x - 15$ ✓✓**M**<br>$= x^2 + 2x - 15$✓**CA** | 1 mark for $x^2 - 3x$.<br>*1 punt vir* $x^2 - 3x$.<br>1 mark for $5x - 15$.<br>*1 punt vir* $5x - 15$.<br>1 mark for continuous accuracy **CA**.<br>*1 punt vir deurlopende akkuraatheid* ***"CA"***. | (3) |
| | | | | |
| | 6.3.3 | $\frac{25z^2 - 9}{5z + 3}$<br>$= \frac{(5z-3)(5z+3)}{5z+3}$✓✓**M**<br>$= 5z - 3$✓**CA** | 1 mark for each factor.<br>*1 punt vir elke faktor*.<br>$(5z - 3)(5z + 3)$.<br><br>1 mark for answer.<br>*1 punt vir antwoord.* | (3) |
| | | | | |
| 6.4 | 6.4.1 | $3x(q-r) - 2(q-r)$<br>$= (q-r)(3x-2)$ ✓**A** | 1 mark for correct answer.<br>*1 punt vir korrekte antwoord.* | (1) |
| | | | | |
| | 6.4.2 | $2x^3 - 10x^2 - 28x$<br>$= 2x(x^2 - 5x - 14)$✓**M**<br>$= 2x(x+2)(x-7)$ ✓✓**CA** | 1 mark for common factor $2x$.<br>*1 punt vir GGF* $2x$.<br>1 mark for each factor $(x+2)(x-7)$.<br>*1 punt vir elke faktor* $(x+2)(x-7)$. | (3) |
| | | | | **[13]** |

**QUESTION/*VRAAG* 7**

| | | | | |
|---|---|---|---|---|
| 7.1 | Five subtracted from a number then the answer multiplied by three to give an answer of 16**.**<br>*Vyf afgetrek van 'n sekere getal en die antwoord vermenigvuldig met drie om 'n antwoord van 16 te gee.* ✓**A** | | 1 mark for answer.<br>*1 punt vir antwoord.*<br>**Consider alternative responses which mean the same.**<br>***Oorweeg alternatiewe antwoorde met dieselfde betekenis.*** | (1) |
| | | | | |
| 7.2 | $2\left(\frac{1}{2}x+4\right)-1=13$✓**A** | | 1 mark for answer.<br>*1 punt vir antwoord.* | (1) |
| | | | | |
| 7.3 | 7.3.1 | $0{,}3x-2{,}1=0{,}7-0{,}4x$<br>$0{,}3x+0{,}4x=0{,}7+2{,}1$<br>$0{,}7x=2{,}8$✓**M**<br>$x=4$✓**CA** | 1 mark for $0{,}7x=2{,}8$.<br>*1 punt vir* $0{,}7x=2{,}8$.<br>1 mark for answer.<br>*1 punt vir antwoord.* | (2) |
| | | | | |
| | 7.3.2 | $9^{x+1}=\frac{1}{27}$<br>$3^{2x+2}=3^{-3}$✓**M**<br>$\therefore 2x+2=-3$✓**M**<br>$x=\frac{-5}{2}$✓**CA**<br><br>**OR/*OF***<br>$x=-2\frac{1}{2}$✓**CA** | 1 mark for prime factorisation of bases.<br>*1 punt vir priemfaktorisering van basisse.*<br>1 mark for equating the exponents.<br>*1 punt vir gelykstelling van eksponente.*<br><br>1 mark for answer.<br>*1 punt vir antwoord.* | (3) |
| | | | | |
| | 7.3.3 | $\frac{5x-7}{3}-\frac{7x-10}{5}=1$<br>$\frac{15(5x-7)}{3}-\frac{15(7x-10)}{5}=15$✓**M**<br>$5(5x-7)-3(7x-10)=15$<br>$25x-35-21x+30=15$✓**M**<br>$4x=15+35-30$<br>$4x=20$<br>$x=5$✓**CA** | 1 mark for multiplying all terms by 15.<br>*1 punt vir vermenigvuldiging van alle terme met 15.*<br><br>1 mark for simplification.<br>*1 punt vir vereenvoudiging.*<br><br>1 mark for answer.<br>*1 punt vir antwoord.* | (3) |
| | | | | |
| 7.4 | $x^2+2x=3$✓**A**<br>$x^2+2x-3=0$<br>$(x-1)(x+3)=0$✓**M**<br>$x=1$ *or* $x=-3$✓ ✓**CA** | | 1 mark for setting up correct equation.<br>*1 punt vir opstel van 'n korrekte vergelyking.*<br>1 mark for correct factors.<br>*1 punt vir korrekte faktore.*<br>1 mark per answer.<br>*1 punt per antwoord.* | (4) |
| | | | | **[14]** |
| | | | | |
| | | | **TOTAL/*TOTAAL*** | **75** |