



**GAUTENG PROVINCE**  
EDUCATION  
REPUBLIC OF SOUTH AFRICA

# PROVINSIALE EKSAMEN

## JUNIE 2022

## GRAAD 9

**WISKUNDE**

**TYD: 1½ uur**

**PUNTE: 75**

**11 bladsye**

**NAAM VAN LEERDER:** \_\_\_\_\_

**GRAAD:** \_\_\_\_\_

**INSTRUKSIES EN INLIGTING**

1. Hierdie vraestel bestaan uit 7 vrae.
2. Antwoord AL die vrae.
3. 'n Nie-programmeerbare sakrekenaar mag gebruik word, tensy anders vermeld.
4. Wys alle berekeninge diagramme en grafieke duidelik aan wat gebruik word om jou antwoorde te bepaal. Slegs antwoorde sal nie noodwendig volpunte verdien nie.
5. Indien nodig, rond jou antwoorde af tot 2 desimale plekke, tensy anders vermeld.
6. Diagramme is nie noodwendig volgens skaal geteken nie.
7. Beantwoord VRAAG 1, by Afdeling A deur om die letter langs die regte antwoord te omring.
8. Beantwoord VRAE 2 tot 7 by Afdeling B in die spasies wat voorsien is op die vraestel.
9. Skryf netjies en leesbaar.

## AFDELING A

## VRAAG 1

Antwoord die volgende vrae deur die regte antwoord te kies. Omkring die letter langs die regte antwoord.

1.1 Voltooi:  $(2x + y)^0$

- A  $2x + y$
- B  $x + y$
- C 1
- D 0

(1)

1.2 Gegee hieronder is twee stellings oor 'n getalpatroon:

- Die eerste term in die reeks is 8.
- Die konstante verskil in die reeks is 2.

Watter van die reekse hieronder voldoen aan die voorskrifte in die bogenoemde stellings?

- A 8; 6; 4; 2; ...
- B 8; 4; 2; 1; ...
- C 8; 16; 32; 64; ...
- D 8; 10; 12; 14; ...

(1)

1.3 In die gegewe uitdrukking,  $m^3 + 3m^2 + 5m + 2$ , is die koëffisiënt van  $m$  ...

- A 1
- B 2
- C 3
- D 5

(1)

1.4 Bepaal die waarde van  $3 - (-5 + 2) + 3$ .

- A 13
- B 9
- C 7
- D 3

(1)

1.5 Vir watter waardes van  $t$  is  $\frac{t}{2t-2}$  ongedefinieerd?

- A 1
- B 2
- C -1
- D -2

(1)  
[5]

## AFDELING B

## VRAAG 2

2.1 Die volgende tabel gee meervoude en faktore van 30, 75 en 100.

| Faktore                         | Getal      | Meervoude                                              |
|---------------------------------|------------|--------------------------------------------------------|
| 1, 2, 3, 5, 6, 10, 15, 30       | <b>30</b>  | 30, 60, 90, 120, 150, 180, 210, 240, 270, 300...       |
| 1, 3, 5, 15, 25, 75             | <b>75</b>  | 75, 150, 225, 300, 375, 450, 525, 600, 675, 750...     |
| 1, 2, 4, 5, 10, 20, 25, 50, 100 | <b>100</b> | 100, 200, 300, 400, 500, 600, 700, 800, 900, 1 000 ... |

2.1.1 Skryf die GGF van 30 en 75 neer.

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(1)

2.1.2 Skryf die KGV van 75 en 100 neer.

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(1)

2.2 Die  $\sqrt[3]{15}$  is tussen watter twee opeenvolgende heelgetalle?

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(2)

2.3 Is die  $\sqrt[3]{15}$  rasionaal of irrasionaal?

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(1)

- 2.4 Bepaal watter EEN van die vier tabelle hieronder verteenwoordig 'n direkte verhouding. Motiveer jou antwoord.

| Tabel A |   |    |    |    | Tabel B |                |    |     |                |
|---------|---|----|----|----|---------|----------------|----|-----|----------------|
| $x$     | 4 | 8  | 12 | 16 | $x$     | 30             | 50 | 100 | 120            |
| $y$     | 5 | 15 | 20 | 25 | $y$     | $6\frac{2}{3}$ | 4  | 2   | $1\frac{2}{3}$ |

| Tabel C |    |    |    |    | Tabel D |    |   |   |   |
|---------|----|----|----|----|---------|----|---|---|---|
| $x$     | 3  | 5  | 8  | 12 | $x$     | 1  | 2 | 3 | 4 |
| $y$     | 12 | 20 | 32 | 48 | $y$     | 10 | 7 | 5 | 2 |

(3)

- 2.5 Dit neem Sandile 6 uur om 1 tenk met water te vul, as hy alleen werk.  
 Jacob neem 12 uur om dieselfde tenk met water te vul, as hy alleen werk.  
 As Sandile en Jacob saam werk om die tenk met water te vul, hoe lank sal dit neem?  
 Gee jou antwoord in ure.

(4)  
[12]

## VRAAG 3

3.1 Watter tipe getalle in die getalsisteem word deur die volgende gedefinieer?

“Getalle wat die natuurlike- en heelgetallesisteem uitbrei deur die bewerking  $a - b$ , waar  $a < b$ , in te sluit.”

(1)

3.2 Die volgende stellings is verkeerd.  
Skryf die korrekte weergawe van elke stelling neer.

| Nr.   | Verkeerde Stelling   | Korrekte Stelling |
|-------|----------------------|-------------------|
| 3.2.1 | $\sqrt[3]{-64} = -8$ |                   |
| 3.2.2 | $-4 - (-6) = -10$    |                   |
| 3.2.3 | $\sqrt{-9} = \pm 3$  |                   |
| 3.2.4 | $(-5)^2 = -25$       |                   |

(4)

3.3 Bereken die volgende.

3.3.1  $(5)(-2)^2 - 15 \div 3$

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(3)

3.3.2 
$$\frac{2 - (-4) - 2(1 - 4)}{1 - 4}$$

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(3)

[11]

## VRAAG 4

4.1 Die eksponensiële vorm van 25 is geskryf as  $5^2$ . Wat beteken die eksponent?

(1)

4.2 Stel die volgende stelling in eksponensiële vorm voor:

“7 tot die vyfde mag”.

(1)

4.3 Herskryf die volgende uitdrukkings met positiewe eksponente.  
Los jou antwoord in die eenvoudigste eksponensiële vorm.

4.3.1  $3x^{-2}$

(1)

4.3.2  $\frac{2}{5^{-2}}$

(1)

4.4 Vereenvoudig die volgende volledig:

4.4.1  $\frac{(-5wz)^2(-2w^2z)}{50w^{-1}z}$

(4)

4.4.2  $\frac{81^{x+1} \cdot 5^{2x-2}}{3^{4x} \cdot 25^x}$

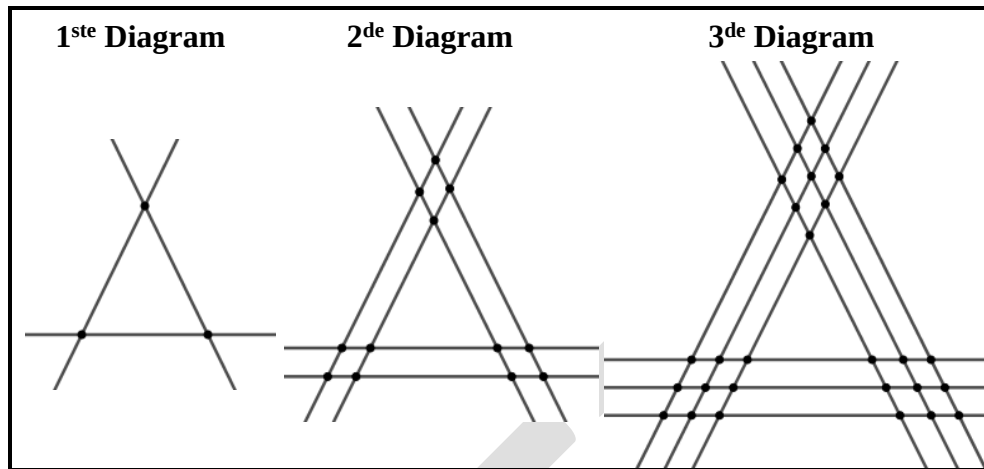
(5)

[13]

b.o.

## VRAAG 5

5.1 Bestudeer die eerste drie diagramme uit die reeks diagramme hieronder.



5.1.1 Voltooi die tabel deur die aantal snypunte in die volgende twee diagramme te bepaal.

| Posisie van die diagram | 1 | 2  | 3  | 4 | 5 |
|-------------------------|---|----|----|---|---|
| Aantal snypunte         | 3 | 12 | 27 |   |   |

(2)

5.1.2 Beskryf die verhouding tussen die posisie van die diagram en die aantal snypunte in elke diagram in jou eie woorde.

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(2)

5.2 Getalle is gerangskik in die volgende getalpatroon. Indien die patroon uitgebrei word, wat sal die vyfde getal in die 100<sup>ste</sup> ry wees?

|             |    |    |    |    |    |    |
|-------------|----|----|----|----|----|----|
| <b>Ry 1</b> | 21 | 22 | 23 | 24 | 25 | 26 |
| <b>Ry 2</b> | 27 | 28 | 29 | 30 | 31 | 32 |
| <b>Ry 3</b> | 33 | 34 | 35 | 36 | 37 | 38 |

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(3)

[7]

b.o.

## VRAAG 6

6.1 Wat noem ons 'n algebraïese uitdrukking wat twee terme bevat? (1)

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6.2 Waarna word  $x$  en  $y$  verwys in die uitdrukking  $2y^4 - 3x^2y^2 + 5x^3$ ? (1)

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6.3 Vereenvoudig die volgende volledig:

6.3.1  $\sqrt{9x^4y^2}$

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(1)

6.3.2  $(x + 5)(x - 3)$

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(3)

6.3.3  $\frac{25z^2 - 9}{5z + 3}$

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(3)

6.4 Faktoriseer volledig:

6.4.1  $3x(q - r) - 2(q - r)$

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(1)

6.4.2  $2x^3 - 10x^2 - 28x$

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(3)

[13]

b.o.

## VRAAG 7

7.1 Beskryf  $3(x - 5) = 16$ , in woorde.

(1)

7.2 Vertaal die volgende stelling in 'n wiskundige vergelyking.

Die som van die helfte van 'n getal en 4 word verdubbel, en word dan verminder met 1 om 'n antwoord van 13 te gee.

(1)

7.3 Los op vir  $x$ :

7.3.1  $0,3x - 2,1 = 0,7 - 0,4x$

(2)

7.3.2  $9^{x+1} = \frac{1}{27}$

(3)

7.3.3  $\frac{5x - 7}{3} - \frac{7x - 10}{5} = 1$

(3)

7.4 Die vierkant van 'n getal getel by twee keer die getal is gelyk aan drie.  
Bepaal die moontlike waardes van die getal.

(4)

[14]

TOTAAL: 75

EINDE



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JUNE/*JUNIE* 2022  
GRADE/*GRAAD* 9  
MARKING GUIDELINES/  
*NASIENRIGLYNE***

**MATHEMATICS/*WISKUNDE***

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## 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 | <p>Table C/Tabel C✓A</p> <p><b>Possible justification/Moontlike redes</b><br/> <math>\frac{x}{y} = a \text{ constant/n konstante}</math>✓✓A<br/> <b>OR/OF</b><br/>           As the values of <math>x</math> increase, the values of <math>y</math> also increase in the same proportion./Soos die waardes van <math>x</math> toeneem, neem die waardes van <math>y</math> ook toe in dieselfde verhouding proporsie. ✓✓A<br/> <b>OR/OF</b><br/>           As the values of <math>x</math> decrease, the values of <math>y</math> also decrease in the same proportion./Soos daar 'n afname in die waarde van <math>x</math> is, is daar ook 'n afname in die waarde van <math>y</math> in dieselfde verhouding/proporsie. ✓✓A</p> |       | <p>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.</p> <p>(Award only 1 mark for justification if learner did not mention “<b>same proportion</b>” or any explanation to that effect.)<br/>           /(Ken slegs 1 punt toe in gevalle waar leerder nie <b>dieselfde verhouding/proporsie</b> of soortgelyke verduideliking gee nie.)</p> | (3) |

Commented [AN1]:

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

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QUESTION/VRAAG 3

| 3.1     | Integers/Heelgetalle✓A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                          |                                                                                                                                                                                                                                                  | 1 mark for answer.<br>1 punt vir die antwoord. | (1)   |                      |                         |       |                   |                    |       |                     |                                                        |       |                |                  |                                                                       |  |     |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|----------------------|-------------------------|-------|-------------------|--------------------|-------|---------------------|--------------------------------------------------------|-------|----------------|------------------|-----------------------------------------------------------------------|--|-----|
| 3.2     | <table><tr><th>No. Nr.</th><th>Incorrect Statement<br/>Verkeerde Stelling</th><th>Correct Statement<br/>Korrekte Stelling</th></tr><tr><td>3.2.1</td><td><math>\sqrt[3]{-64} = -8</math></td><td><math>\sqrt[3]{-64} = -4</math>✓A</td></tr><tr><td>3.2.2</td><td><math>-4 - (-6) = -10</math></td><td><math>-4 - (-6) = 2</math>✓A</td></tr><tr><td>3.2.3</td><td><math>\sqrt{-9} = \pm 3</math></td><td><math>\sqrt{-9}</math> is non-real/<br/><math>\sqrt{-9}</math> is nie-reël ✓A</td></tr><tr><td>3.2.4</td><td><math>(-5)^2 = -25</math></td><td><math>(-5)^2 = 25</math>✓A</td></tr></table> | No. Nr.                                                                                                  | Incorrect Statement<br>Verkeerde Stelling                                                                                                                                                                                                        | Correct Statement<br>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/<br>$\sqrt{-9}$ is nie-reël ✓A | 3.2.4 | $(-5)^2 = -25$ | $(-5)^2 = 25$ ✓A | 1 mark for each correct answer.<br>1 punt vir elke korrekte antwoord. |  | (4) |
| No. Nr. | Incorrect Statement<br>Verkeerde Stelling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Correct Statement<br>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/<br>$\sqrt{-9}$ is nie-reël ✓A                                                   |                                                                                                                                                                                                                                                  |                                                |       |                      |                         |       |                   |                    |       |                     |                                                        |       |                |                  |                                                                       |  |     |
| 3.2.4   | $(-5)^2 = -25$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | $(-5)^2 = 25$ ✓A                                                                                         |                                                                                                                                                                                                                                                  |                                                |       |                      |                         |       |                   |                    |       |                     |                                                        |       |                |                  |                                                                       |  |     |
| 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><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]    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                          |                                                                                                                                                                                                                                                  |                                                |       |                      |                         |       |                   |                    |       |                     |                                                        |       |                |                  |                                                                       |  |     |

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#### QUESTION/VRAAG 4

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

|                                     |                                       |
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| MARKING GUIDELINES<br>NASIENRIGLYNE | MATHEMATICS/WISKUNDE<br>GRADE/GRAAD 9 |
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|       |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 4.4.2 | $\frac{81^{x+1} \cdot 5^{2x-2}}{3^{4x} \cdot 25^x}$ $= \frac{(3^4)^{x+1} \cdot 5^{2x-2}}{3^{4x} \cdot (5^2)^x} \checkmark M$ $= \frac{3^{4x+4} \cdot 5^{2x-2}}{3^{4x} \cdot 5^{2x}} \checkmark M$ $= 3^{4x+4-4x} \cdot 5^{2x-2-2x}$ $= 3^4 \cdot 5^{-2} \checkmark \checkmark M$ $= \frac{81}{25} \checkmark CA$ | <p>1 mark for prime factorising of 81 and 25.<br/>1 punt vir priemfaktoriserings van 81 en 25.</p> <p>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.</p> <p>1 mark for application of quotient rule for each base.<br/>1 punt vir toepassing van die kwosiëntreël vir elke basis.</p> <p>1 mark for the answer.<br/>1 punt vir die antwoord.</p> | (5)  |
|       |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             | [13] |

|                                                   |                                                     |
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**QUESTION/VRAAG 5**

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

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#### 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/OR<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] |                                                                                         |                                                                                                                                                                                           |     |

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**QUESTION/VRAAG 7**

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