



**GAUTENG PROVINCE**  
EDUCATION  
REPUBLIC OF SOUTH AFRICA

**GAUTENGSE DEPARTEMENT VAN ONDERWYS**  
**PROVINSIALE EKSAMEN**  
**NOVEMBER 2020**

**GRAAD 10**

**WISKUNDE**  
**(VRAESTEL 1)**

**TYD: 1 uur**  
**PUNTE: 50**

**5 bladsye**

### INSTRUKSIES EN INLIGTING

1. Hierdie vraestel bestaan uit **SES** vrae
2. Beantwoord **AL** die vrae.
3. Toon **ALLE** berekeninge, diagramme, grafieke, ensovoorts wat jy gebruik het om die antwoorde te bepaal.
4. **SLEGS** antwoorde sal **NIE** noodwendig volpunte verdien **NIE**.
5. Jy mag 'n goedgekeurde wetenskaplike sakrekenaar gebruik (nie-programmeerbaar en nie-grafies), tensy anders vermeld.
6. Diagramme word **NIE** noodwendig volgens skaal geteken nie.
7. Indien nodig, rond antwoorde af tot **TWEE** desimale plekke, tensy anders vermeld.
8. Nommer jou antwoorde volgens die nommeringstelsel wat in hierdie vraestel gebruik word.
9. Skryf netjies en leesbaar.

### VRAAG 1

Vir watter waarde(s) van  $x$  is die uitdrukking:

$$A = \sqrt{\frac{9}{11-x}}; x \in \{11; -5; 0; 15\}$$

1.1      rasionaal (1)

1.2      nie-reële (1)

1.3      ongedefinieerd (1)

[3]

### VRAAG 2

Vereenvoudig die volgende:

2.1       $\frac{x^2 + x - 6}{3x^2 - 12x} \times \frac{x^2 - 16}{x^2 - 2x^2} \times \frac{1}{x + 4}$  (5)

2.2       $\frac{6^{2-a} \cdot 12a}{2^{a+2}}$  (4)

2.3      As  $a^2 + b^2 = 8ab$ ; bepaal die waarde van  $(a + b)^2$  in terme van  $a$  en  $b$ . (3)

[12]

### VRAAG 3

Faktoriseer die volgende volledig:

3.1       $64p^3 - \frac{1}{27}$  (2)

3.2       $24ky^3 - 6ky - 24y + 96y^3$  (4)

[6]

**VRAAG 4**

4.1 Los op vir  $x$ :

$$\left(\frac{1}{3}\right)^{3x+3} = 729 \quad (3)$$

4.2 Los op vir  $x$  en skryf die antwoord in intervalnotasie:

$$-4 \leq \frac{1-x}{3} < 3 \quad (4)$$

4.3 Kaartjies vir 'n skoolkonsert word teen R6 vir kinders en R10 vir volwassenes verkoop. As altesaam 150 kinders en volwassenes die konsert bywoon en R1 100 toegangsgeld betaal, bepaal hoeveel kinders die konsert bywoon. (4)

[11]

**VRAAG 5**

5.1 Beskou die volgende patroon:

$-3; 1; 5; 9; \dots$

5.1.1 Bepaal die algemene term. (2)

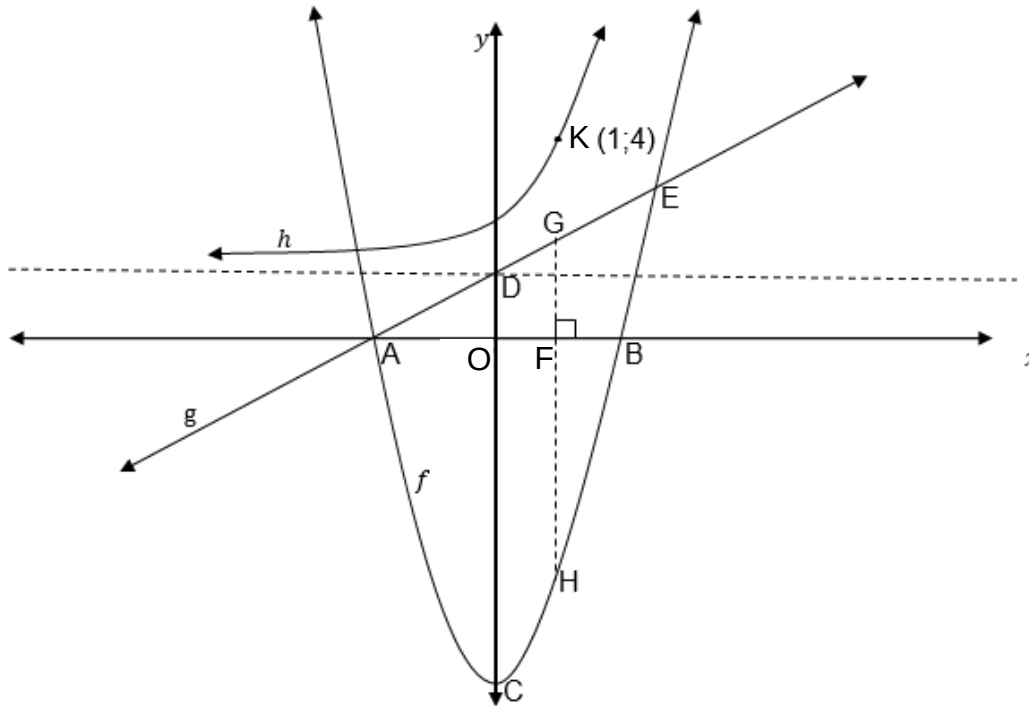
5.1.2 Bereken  $T_{38}$  (1)  
[3]

## VRAAG 6

In die gegewe skets word die volgende grafieke voorgestel:

$$f(x) = 3x^2 - 12, \quad g(x) = x + 2 \quad \text{en} \quad h(x) = a^x + q.$$

A en B is die  $x$ -afsnitte en C is die draaipunt van  $f$ . D is die  $y$ -afsnit van  $g$ . K (1 ; 4) is 'n punt op die grafiek van  $h$ .



- 6.1 Bereken die lengte van GH as  $OF = 1$  eenheid. (3)
- 6.2 Bepaal:
- 6.2.1 die koördinate van E, die snypunt van  $f$  en  $g$  (5)
- 6.2.2 die vergelyking van  $h$  (3)
- 6.2.3  $k$  as  $k$  die refleksie van  $f$  om die  $x$ -as is (2)
- 6.3 Vir watter waarde(s) van  $x$  sal  $f(x) \geq 0$ . (2)

[15]

**TOTAAL**

**50**

**EINDE**



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**PROVINCIAL EXAMINATION  
PROVINSIALE EKSAMEN**

**NOVEMBER 2020**

**GRADE/GRAAD 10**

**MATHEMATICS PAPER 1  
WISKUNDE VRAESTEL 1**

**MARKING GUIDELINES/NASIENRIGLYNE**

**MARKS/PUNTE: 50**

**7 pages/bladsye**

## NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out an attempt of a question and has not redone the question, mark the crossed out version.
- Consistent accuracy applies in ALL aspects of the marking memorandum. Stop marking at the second calculation error.
- Assuming answers/values in order to solve a problem is NOT acceptable.

## OPMERKING:

- *As 'n kandidaat 'n vraag twee maal beantwoord, merk slegs die EERSTE poging.*
- *As 'n kandidaat 'n poging van 'n vraag doodgetrek het, en die vraag nie oorgedoen het nie, merk die deurgehaalde weergawe.*
- *Konsekwente akkuraatheid is van toepassing op ALLE aspekte van die nasienmemorandum. Hou op nasien by die tweede berekeningsfout.*
- *Veronderstelling van antwoorde/waardes om 'n probleem op te los, is NIE aanvaarbaar NIE.*

## QUESTION/VRAAG 1

|     |          |                       |
|-----|----------|-----------------------|
| 1.1 | $x = -5$ | ✓ answer/antwoord (1) |
| 1.2 | $x = 15$ | ✓ answer/antwoord (1) |
| 1.3 | $x = 11$ | ✓ answer/antwoord (1) |
|     |          | [3]                   |

## QUESTION/VRAAG 2

|     |                                                                                                                                                                                                                               |                                                                                                      |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 2.1 | $\frac{x^2 + x - 6}{3x^2 - 12x} \times \frac{x^2 - 16}{x^3 - 2x^2} \times \frac{1}{x + 4}$ $= \frac{(x + 3)(x - 2)}{3x(x - 4)} \times \frac{(x + 4)(x - 4)}{x^2(x - 2)} \times \frac{1}{x + 4}$ $= \frac{x + 3}{3x^3}$        | ✓ $(x + 3)(x - 2)$<br>✓ $(x + 4)(x - 4)$<br>✓ $3x(x - 4)$<br>✓ $x^2(x - 2)$<br>✓ answer/antwoord (5) |
| 2.2 | $\frac{6^{2-a} \cdot 12^a}{2^{a+1}}$ $= \frac{(2 \cdot 3)^{2-a} \cdot (3 \cdot 2^2)^a}{2^{a+1}}$ $= \frac{2^{2-a} \cdot 3^{2-a} \cdot 3^a \cdot 2^{2a}}{2^{a+1}}$ $= 2^{2-a+2a-a-1} \cdot 3^{2-a+a}$ $= 2^1 \cdot 3^2$ $= 18$ | ✓ $2^{2-a+2a-a-1}$<br>✓ $3^{2-a+a}$<br>✓ $2^1 \cdot 3^2$<br>✓ answer/antwoord (4)                    |

|     |                                                                                        |                                                                                                                              |
|-----|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 2.3 | $(a + b)^2$<br>$= a^2 + 2ab + b^2$<br>$= a^2 + b^2 + 2ab$<br>$= 8ab + 2ab$<br>$= 10ab$ | $\checkmark a^2 + 2ab + b^2$<br>$\checkmark$ rearrangement<br><i>/herrangskikking</i><br>$\checkmark$ answer/antwoord<br>(3) |
|     |                                                                                        | [12]                                                                                                                         |

## QUESTION/VRAAG 3

|     |                                                                                                                                                                      |                                                                                                                                                                   |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1 | $64p^3 - \frac{1}{27}$<br>$= \left(4p - \frac{1}{3}\right) \left(16p^2 + \frac{4}{3}p + \frac{1}{9}\right)$                                                          | $\checkmark \left(4p - \frac{1}{3}\right)$<br>$\checkmark \left(16p^2 + \frac{4}{3}p + \frac{1}{9}\right)$<br>(2)                                                 |
| 3.2 | $24ky^3 - 6ky - 24y + 96y^3$<br>$= 6ky(4y^2 - 1) - 24y(1 - 4y^2)$<br>$= 6ky(4y^2 - 1) + 24y(4y^2 - 1)$<br>$= (6ky + 24y)(4y^2 - 1)$<br>$= 6y(k + 4)(2y + 1)(2y - 1)$ | $\checkmark 6ky(4y^2 - 1) - 24y(1 - 4y^2)$<br>$\checkmark + 24y(4y^2 - 1)$<br>$\checkmark (6ky + 24y)(4y^2 - 1)$<br>$\checkmark 6y(k + 4)(2y + 1)(2y - 1)$<br>(4) |
|     |                                                                                                                                                                      | [6]                                                                                                                                                               |

## QUESTION/VRAAG 4

|     |                                                                                                                                                                                                                                    |                                                                                                                                                            |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1 | $\left(\frac{1}{3}\right)^{3x+3} = 729$<br>$3^{-(3x+3)} = 3^6$<br>$-3x - 3 = 6$<br>$-3x = 6 + 3$<br>$\therefore x = -3$                                                                                                            | $\checkmark 3^{-(3x+3)} = 3^6$<br>$\checkmark -3x - 3 = 6$<br>$\checkmark x = -3$<br>(3)                                                                   |
| 4.2 | $-4 \leq \frac{1-x}{3} < 3$<br>$-4 \times 3 \leq 1 - x < 3 \times 3$<br>$-12 \leq 1 - x < 9$<br>$-12 - 1 \leq -x < 9 - 1$<br>$-13 \leq x < 8$<br>$\therefore -8 < x \leq 13$<br>$x \in (-8; 13]$                                   | $\checkmark -12 \leq 1 - x < 9$<br>$\checkmark -13 \leq x < 8$<br>$\checkmark -8 < x \leq 13$<br>$\checkmark$ Interval notation/<br>Intervalnotasie<br>(4) |
| 4.3 | number of children/aantal kinders: $x$<br>Adults/volwassenes : $150 - x$<br>$\therefore 6x + 10(150 - x) = R1100$<br>$6x + 1500 - 10x = R1100$<br>$-4x = 1100 - 1500$<br>$\therefore x = 100$<br>$\therefore 100$ children/kinders | $\checkmark 6x + 10(150 - x)$<br>$\checkmark = R1100$<br>$\checkmark$ simplifying/<br>vereenvoudiging<br>$\checkmark$ answer/antwoord<br>(4)               |
|     |                                                                                                                                                                                                                                    | [11]                                                                                                                                                       |

|       |                                                                                                                                                                                                                              |                                                                                                                                  |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 5.1   | $T_n = dn + c$<br>For/Vir $n = 1$<br>$-3 = 4(1) + c$<br>$\therefore c = -7$<br>$T_n = -3 + 4n - 4$<br>$\therefore T_n = 4n - 7$<br><p style="text-align: center;"><b>OR/OF</b></p> $T_n = 4n - 7$ answer only/slegs antwoord | $\checkmark c = -7$<br>$\checkmark 4n - 7$<br><p style="text-align: center;"><b>OR/OF</b></p> $\checkmark 4n$<br>$\checkmark -7$ |
| 5.1.2 | $T_{38} = 4(38) - 7$<br>$T_{38} = 145$                                                                                                                                                                                       | $\checkmark T_{38} = 145$                                                                                                        |
|       |                                                                                                                                                                                                                              |                                                                                                                                  |

## QUESTION/VRAAG 6

|       |                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                   |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.1   | $y = x + 2$<br>$y = 1 + 2$<br>$FG = 3 \text{ units/eenhede}$<br>$y = 3x^2 - 12$<br>$y = 3(1)^2 - 12$<br>$FH = 9 \text{ units/eenhede}$<br>$GH = FG + FH$<br>$GH = 12 \text{ units/eenhede}$                      | $\checkmark FG = 3 \text{ units/eenhede}$<br>$\checkmark FH = 9 \text{ units/eenhede}$<br>$\checkmark GH = 12 \text{ units/eenhede}$<br>(3)                                                                                                                                       |
| 6.2.1 | $x + 2 = 3x^2 - 12$<br>$3x^2 - x - 14 = 0$<br>$(3x - 7)(x + 2) = 0$<br>$x = \frac{7}{3} \text{ and/en } x = -2$<br>$y = x + 2$<br>$y = \frac{7}{3} + 2$<br>$= \frac{13}{3}$<br>$E = (\frac{7}{3}; \frac{13}{3})$ | $\checkmark x + 2 = 3x^2 - 12$<br>$\checkmark \text{standard form/}$<br>$\text{standaardvorm}$<br>$\checkmark \text{factors/faktore}$<br>$\checkmark \text{both/beide}$<br>$\checkmark \text{substitute/vervang } \frac{7}{3}$<br>$\checkmark (\frac{7}{3}; \frac{13}{3})$<br>(5) |
| 6.2.2 | asymptote/asimptoot $y = 2$ and/en<br>point/punt $(1; 4)$<br>$y = a^x + q$<br>$4 = a^1 + 2$<br>$4 - 2 = a^1$<br>$\therefore a = 2$<br>$\therefore y = 2^x + 2$                                                   | $\checkmark \text{Asymptote/Asimptoot}$<br>$y = 2$<br>$\checkmark 4 = a^1 + 2$<br>$\checkmark a = 2$<br>(3)                                                                                                                                                                       |
| 6.2.3 | $y = -3x^2 + 12$                                                                                                                                                                                                 | $\checkmark \text{correct answer/korrekte}$<br>$\text{antwoord}$<br>(2)                                                                                                                                                                                                           |
| 6.3   | $f(x) = 3x^2 - 12$<br>$x \leq -2 \text{ or/of } x \geq 2$                                                                                                                                                        | $\checkmark x \leq -2$<br>$\checkmark x \geq 2$<br>(2)                                                                                                                                                                                                                            |
|       |                                                                                                                                                                                                                  | [15]                                                                                                                                                                                                                                                                              |
|       |                                                                                                                                                                                                                  | TOTAL/TOTAAL 50                                                                                                                                                                                                                                                                   |