



JAARLIKSE NASIONALE ASSESSERING
2014
GRAAD 9 WISKUNDE MODELVRAE
MEMORANDUM

| SLEUTEL | |
|-----------|------------------------------|
| M | Punt vir metode |
| KA | Deurgaans akkurate bewerking |
| A | Akkuraatheid |

1. MEERVOUDIGEKEUSE-VRAE

| | | | | | | | | | | | | |
|----|-----|----------|-----|----------|-----|----------|-----|----------|------|----------|---|-------------|
| 1. | 1.1 | C | 1.2 | C | 1.3 | B | 1.4 | C | 1.5 | B | Gee een punt vir elke korrekte antwoord | [10] |
| | 1.6 | C | 1.7 | D | 1.8 | C | 1.9 | D | 1.10 | B | | |

2. GETALLE, BEWERKINGS EN VERWANTSAPPE

| | | | |
|-------|---|--|-----|
| 2.1.1 | 0,0067 A✓ | 1 punt | (1) |
| 2.1.2 | $3,56 \times 10^{-6}$ A✓ | 1 punt | (1) |
| 2.1.3 | 2,7; $2\sqrt{2}$; 8 ✓ A omdat $2\sqrt{2} \approx 2,83$ | 1 punt | (1) |
| 2.1.4 | $-3\sqrt{3}$; -5,25; -16 A✓ omdat $-3\sqrt{3} \approx -5,20$ | 1 punt | (1) |
| 2.1.5 | $9 < 13 < 16$ $3 < \sqrt{13} < 4$ ✓ A | Antwoord: 1 punt | (1) |
| 2.2.1 | $0,125 \div \sqrt{25}$ $= 0,125 \div 5$ ✓ M $= 0,025$ ✓ KA | 5: 1 punt Antwoord: 1 punt | (2) |
| 2.2.2 | $\left(2\frac{1}{2}\right)^2 + (0,5)^2$ $= \frac{25}{4} + 0,25$ ✓ M $= \frac{25}{4} + \frac{1}{4}$ ✓ M $= \frac{26}{4}$ $= 6\frac{1}{2}$ ✓ A of $6,25 + 0,25$ ✓ M $= 6,5$ ✓✓ A | $\frac{25}{4}$: 1 punt $\frac{1}{4}$: 1 punt Antwoord: 1 punt | (3) |
| 2.2.3 | $(\sqrt{169} + 3 \times 5) \div 2$ ✓ M $= (13 + 15) \div 2$ ✓ A $= 14$ ✓ KA | $(\sqrt{169} + 3 \times 5) \div 2$: 1 punt 13 + 15: 1 punt Antwoord: 1 punt | (3) |
| 2.2.4 | $\sqrt[3]{10^3} \times \sqrt{0,01}$ $= 10 \times 0,1$ ✓✓ M $= 1$ ✓ KA | 10: 1 punt 0,1: 1 punt Antwoord: 1 punt | (3) |

| | | | |
|------|---|---|-----|
| 2.3 | $96:120 \checkmark \text{ M}$ $= 8:10$ $= 4:5 \checkmark \text{ A}$ | Eweredigheid: 1 punt Antwoord: 1 punt | (2) |
| 2.4 | $\frac{250}{50} : \frac{150}{50} : \frac{100}{50} \checkmark \text{ M}$ $= 5:3:2 \checkmark \text{ A}$ | Vereenvoudiging: 1 punt Antwoord: 1 punt | (2) |
| 2.5 | $\frac{5}{3} \div \frac{8}{3} \checkmark \text{ M}$ $= 5:8 \checkmark \text{ A}$ | $\frac{5}{3} \div \frac{8}{3}$: 1 punt Antwoord: 1 punt | (2) |
| 2.6 | $5:3:4 = 12 \text{ M}$ $1\text{ste gewig} = \frac{5}{12} \times 240g = 100g \checkmark \text{ A}$ $2\text{de gewig} = \frac{3}{12} \times 240g = 60g \checkmark \text{ A}$ $3\text{de gewig} = \frac{4}{12} \times 240g = 80g \checkmark \text{ A}$ of $3\text{de gewig} = 240g - (100g + 60g) = 80g \checkmark \text{ A}$ | 1 punt 1 punt 1 punt | (3) |
| 2.7 | Verminderde bedrag = $\frac{2}{5} \times R1\,250 \checkmark \text{ M}$ $= R500 \checkmark \text{ A}$ | $\frac{2}{5}$: 1 punt Antwoord: 1 punt | (2) |
| 2.8 | Vermeerderde getal = $\frac{5}{2} \times 280 \checkmark \text{ M}$ $= 700 \checkmark \text{ A}$ | $\frac{5}{2}$: 1 punt Antwoord: 1 punt | (2) |
| 2.9 | $P, n, i = ER \checkmark \text{ M}$ $3\,000(n)(0,8) = 960 \checkmark \text{ M}$ $n = 4 \checkmark \text{ A}$ of $A = P(1 + ni) \checkmark \text{ M}$ $3\,960 = 3\,000(1 + 0,08n) \checkmark \text{ M}$ $1,32 = 1 + 0,08n$ $0,32 = 0,08n$ $n = 4 \checkmark \text{ A}$ | formule/vervanging: 2 punte Antwoord: 1 punt | (3) |
| 2.10 | $A = P(1 + i)^n \checkmark \text{ M}$ $A = R6\,500(1 + 0,075)^3 \checkmark \text{ M}$ $A = R8\,074,93 \checkmark \text{ A}$ Rente = A-P $= R1\,574,93 \checkmark \text{ KA}$ of Jaar 1: $R6\,500 \times 7,5\% = R487,50 \checkmark \text{ M}$ Jaar 2: $R6\,987,50 \times 7,5\% = R524,06 \checkmark \text{ M}$ Jaar 3: $R7\,511,56 \times 7,5\% = R563,37 \checkmark \text{ M}$ Totale rente is $R1\,574,93 \checkmark \text{ M}$ | Formule/vervanging: 2 punte Berekening: 1 punt Antwoord: 1 punt | (4) |
| 2.11 | $A = P(1 + i)^n \checkmark \text{ M}$ $A = R10\,000(1 + 0,1)^3 \checkmark \checkmark \text{ M}$ $= R13\,310,00 \checkmark \text{ A}$ of Jaar 1: $R10\,000 \times 10\% = R1\,000,00 \checkmark \text{ M}$ Jaar 2: $R11\,000 \times 10\% = R1\,100,00 \checkmark \text{ M}$ Jaar 3: $R12\,100 \times 10\% = R1\,210,00 \checkmark \text{ M}$ Die finale bedrag = $R10\,000 + R3\,310$ $= R13\,310,00 \checkmark \text{ KA}$ | Formule/vervanging: 3 punte Antwoord: 1 punt | (4) |

| 2.12 | <table><tr><th>Spoed (km/h)</th><th>Tyd (h)</th></tr><tr><td>80</td><td>3</td></tr><tr><td>50</td><td>x</td></tr></table> <p>$50x = 80(3)$ ✓✓ M (indirekte eweredigheid)</p> <p>$x = \frac{80(3)}{50}$ ✓ A</p> <p>$= 4,8 \text{ h}$ ✓ KA</p> <p>of</p> <p>$s = \frac{d}{t}$</p> <p>$d = 80 \frac{\text{km}}{\text{h}} \times 3 \text{ h}$ M</p> <p>$d = 240 \text{ km}$ ✓✓ A</p> <p>$t = \frac{d}{s}$</p> <p>$t = \frac{240 \text{ km}}{50 \text{ km/h}}$ M</p> <p>$= 4,8 \text{ uur of } 4 \text{ uur } 48 \text{ min}$ ✓✓ KA</p> | Spoed (km/h) | Tyd (h) | 80 | 3 | 50 | x | Formule/vervanging: 2 punte x: 1 punt | Antwoord: 1 punt | (4) |
|-----------------|--|-----------------|------------|-----|-----------------|-----|------|--|------------------|-----|
| Spoed (km/h) | Tyd (h) | | | | | | | | | |
| 80 | 3 | | | | | | | | | |
| 50 | x | | | | | | | | | |
| 2.13 | <table><tr><td>Lengte in m</td><td>3,5</td><td>x</td></tr><tr><td>Skaduwee in m</td><td>5,2</td><td>29,2</td></tr></table> <p>$\frac{x}{29,2} = \frac{3,5}{5,2}$ ✓✓ M (direkte eweredigheid)</p> <p>$x = \frac{3,5 \times 29,2}{5,2}$ ✓ M</p> <p>$= 19,65 \text{ m}$ ✓ A</p> | Lengte in m | 3,5 | x | Skaduwee in m | 5,2 | 29,2 | Formule/vervanging: 2 punte x: 1 punt | Antwoord: 1 punt | (4) |
| Lengte in m | 3,5 | x | | | | | | | | |
| Skaduwee in m | 5,2 | 29,2 | | | | | | | | |

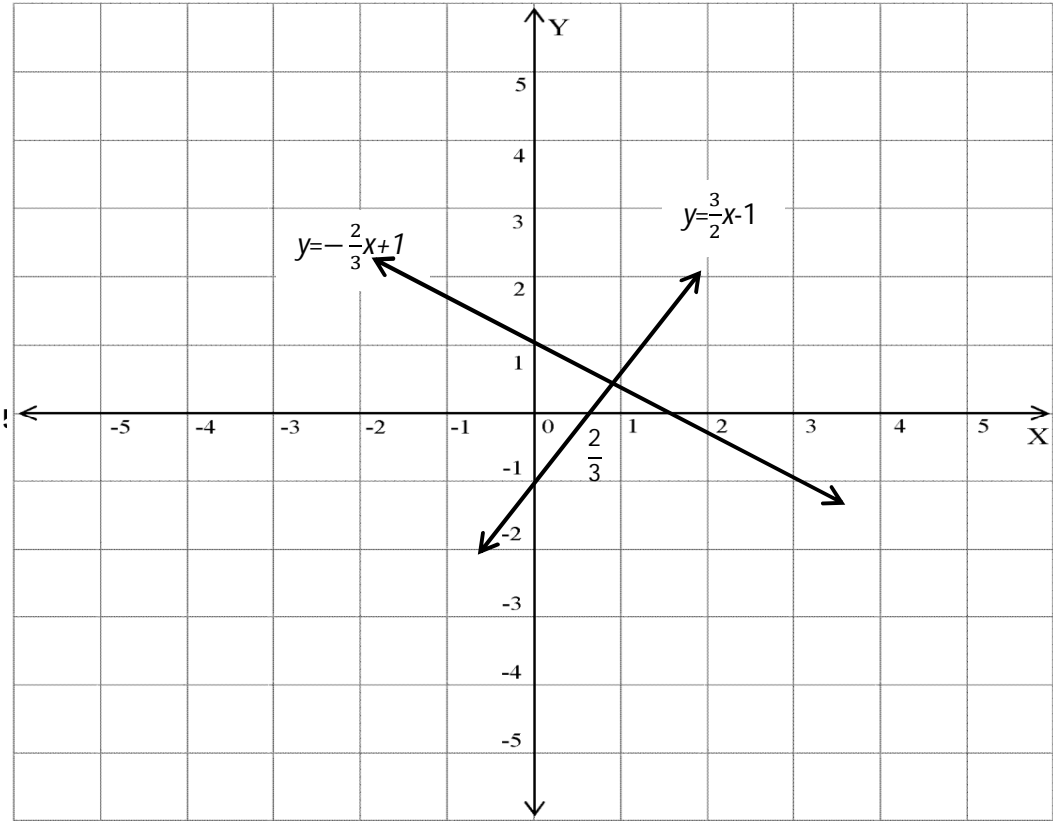
3. PATRONE, FUNKSIES EN ALGEBRA

| | | | |
|-------|---|--|-----|
| 3.1.1 | $(2x)^2 + 3x^2$ $= 4x^2 + 3x^2$ ✓ M $= 7x^2$ ✓ KA | <p>$4x^2$: 1 punt Antwoord: 1 punt</p> | (2) |
| 3.1.2 | $(a^2 b^3)^2 \cdot ab^2 - (ab)^5$ $= a^4 b^6 ab^2 - a^5 b^5$ ✓✓ M $= a^5 b^8 - a^5 b^5$ ✓ M $= a^5 b^5 (b^3 - 1)$ ✓ A | <p> $a^4 b^6 ab^2$: 1 punt $a^5 b^5$: 1 punt Toepassing eksponensiële wet: 1 punt Antwoord: 1 punt </p> | (4) |
| 3.1.3 | $\frac{5a^2b}{3ab} \times \frac{27}{20a^3b}$ ✓ M $= \frac{9}{4a^2b}$ ✓✓ A | <p> Inverse: 1 punt 9: 1 punt $4a^2b$: 1 punt </p> | (3) |
| 3.1.4 | $\frac{2x^{-2} \times x^3}{2^2 x^2}$ ✓ M $= \frac{x}{2}$ of $\frac{1}{2}x$ ✓ A | <p> Toepassing eksponensiële wet: 1 punt Antwoord: 1 punt </p> | (2) |
| 3.1.5 | $\frac{4x^{-2}}{(4x)^{-2}}$ $= \frac{4x^{-2}}{4^{-2} x^{-2}}$ ✓ M $= 4^3$ ✓ KA $= 64$ ✓ A | <p> $4^{-2} x^{-2}$: 1 punt 4^3: 1 punt Antwoord: 1 punt </p> | (3) |

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|-------|---|---|-----|
| 3.1.6 | $\frac{x(x+2)}{x(x^2-2)} \times \frac{x-2}{(x+2)(x-2)} \checkmark\checkmark\checkmark\mathbf{M}$ $= \frac{1}{x^2-2} \checkmark\mathbf{A}$ | $x(x+2)$: 1 punt $x(x^2-2)$: 1 punt $(x+2)(x-2)$: 1 punt Antwoord: 1 punt | (4) |
| 3.1.7 | $\frac{x-2}{2x} - \frac{x-3}{3x}$ $= \frac{3(x-2) - 2(x-3)}{3(x-2) - 2(x-3)} \checkmark\checkmark\mathbf{M}$ $= \frac{6x}{3x-6-2x+6} \checkmark\mathbf{M}$ $= \frac{x}{6x} \checkmark\mathbf{A}$ $= \frac{1}{6} \checkmark\mathbf{A}$ | Gemeenskaplike noemer: 1 punt $3(x-2) - 2(x-3)$: 1 punt $3x - 6 - 2x + 6$: 1 punt Vereenvoudig: 1 punt Antwoord: 1 punt | (5) |
| 3.1.8 | $\frac{3a^{-2}b \times 24ab}{9a^2b^{-2}}$ $= \frac{24a^{-1}b^2}{3a^2b^{-2}} \checkmark\mathbf{M}$ $= \frac{8b^4}{a^3} \checkmark\checkmark\mathbf{A}$ | Vereenvoudig: 1 punt $8b^4$: 1 punt a^3 : 1 punt | (3) |
| 3.1.9 | $\frac{x^2-1}{3x+3}$ $= \frac{(x-1)(x+1)}{3(x+1)} \checkmark\checkmark\mathbf{M}$ $= \frac{(x-1)}{3} \checkmark\mathbf{A}$ | $(x-1)(x+1)$: 1 punt $3(x+1)$: 1 punt Antwoord: 1 punt | (3) |
| 3.2.1 | $3a^2bc^2(3a^2-4b-c)$ $= 9a^4bc^2 \checkmark - 12a^2b^2c^2 \checkmark - 3a^2bc^3 \checkmark \mathbf{A}$ | 1 punt vir elke term | (3) |
| 3.2.2 | $(2x-3)(x+1)$ $= 2x^2 \checkmark - x \checkmark - 3 \checkmark \mathbf{A}$ | $2x^2$: 1 punt $-x$: 1 punt -3 : 1 punt | (3) |
| 3.2.3 | $(x-3)^2 - x(x+4)$ $= x^2 - 6x + 9 - x^2 - 4x \checkmark\checkmark$ $= -10x + 9 \checkmark\mathbf{A}$ | $x^2 - 6x + 9$: 1 punt $-x^2 - 4x$: 1 punt Antwoord: 1 punt | (3) |
| 3.3.1 | $10t^2 - 5t$ $= 5t \checkmark (2t - 1) \checkmark \mathbf{A}$ | $5t$: 1 punt $2t - 1$: 1 punt | (2) |
| 3.3.2 | $81 - 100a^2$ $= (9 - 10a) \checkmark (9 + 10a) \checkmark \mathbf{A}$ | $9 - 10a$: 1 punt $9 + 10a$: 1 punt | (2) |
| 3.3.3 | $(x+y)(2+a) \checkmark\checkmark\mathbf{A}$ | Antwoord: 2 punte | (2) |
| 3.3.4 | $6x^3(a-b) + x(b-a)$ $= 6x^3(a-b) - x(a-b) \checkmark\mathbf{M}$ $= x(a-b)(6x^2-1) \checkmark\checkmark\checkmark\mathbf{A}$ | $-x(a-b)$: 1 punt x : 1 punt $(6x^2-1)$: 1 punt $(a-b)$: 1 punt | (4) |
| 3.3.5 | $(a+b)(4-x^2) \checkmark\checkmark\mathbf{M}$ $= (a+b)(2+x)(2-x) \checkmark\mathbf{A}$ | Gemeenskaplike faktor: 1 punt $(4-x^2)$: 1 punt $(2+x)(2-x)$: 1 punt | (3) |
| 3.3.6 | $x^2 + 5x + 6$ $= (x+3)(x+2) \checkmark\checkmark\mathbf{M}$ | $(x+3)$: 1 punt $(x+2)$: 1 punt | (2) |
| 3.3.7 | $2a^2 - 18a + 36$ $= 2(a^2 - 9a + 18) \checkmark\mathbf{M}$ $= 2(a-6)(a-3) \checkmark\checkmark\mathbf{A}$ | $2(a^2 - 9a + 18)$: 1 punt Antwoord: 2 punte | (3) |

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|-------|---|--|-----|
| 3.4.1 | $2x - 5 = 5x + 16$ $-3x \checkmark = 21 \checkmark \mathbf{M}$ of $-21 \checkmark = 3x \checkmark \mathbf{M}$ $x = -7 \checkmark \mathbf{A}$ $-7 = x \checkmark \mathbf{A}$ | $-3x$: 1 punt 21 : 1 punt Antwoord : 1 punt | (3) |
| 3.4.2 | $x - \frac{x-1}{2} = 3$ $\times 2$ $2x - x + 1 = 6 \checkmark \mathbf{M}$ $x + 1 = 6 \checkmark \mathbf{M}$ $x = 5 \checkmark \mathbf{A}$ | Vermenigvuldig met 2: 1 punt Vereenvoudig: 1 punt Antwoord: 1 punt | (3) |
| 3.4.3 | $\frac{(x-2)}{4} + \frac{(2x+1)}{3} = \frac{5}{3}$ $\times 12$ $3(x-2) + 4(2x+1) = 4 \times 5 \checkmark \checkmark \checkmark \mathbf{M}$ $3x - 6 + 8x + 4 = 20 \checkmark \mathbf{M}$ $11x = 22$ $x = 2 \checkmark \mathbf{A}$ | $3(x-2)$: 1 punt $4(2x+1)$: 1 punt 4×5 : 1 punt Vereenvoudig: 1 punt Antwoord: 1 punt | (5) |
| 3.4.4 | $(x-3)(x+4) = 0$ $x-3 = 0$ or $x+4 = 0$ $x = 3 \checkmark$ of $x = -4 \checkmark \mathbf{A}$ | Antwoord: 2 punte | (2) |
| 3.4.5 | $x^2 - 1 = 0$ $(x-1)(x+1) = 0 \checkmark \mathbf{M}$ $x-1 = 0$ of $x+1 = 0$ $x = 1 \checkmark$ of $x = -1 \checkmark \mathbf{A}$ of $x^2 = 1 \checkmark \mathbf{M}$ $\therefore x = 1 \checkmark$ of $x = -1 \checkmark \mathbf{A}$ | Faktorisering: 1 punt Antwoord: 2 punte | (3) |
| 3.4.6 | $3^{x+1} = 3^4 \checkmark$ $x+1 = 4 \checkmark$ $x = 3 \checkmark$ | Toepassing eksponensiële wet: 1 punt Stel eksponente gelyk aan mekaar: 1 punt Antwoord: 1 punt | (3) |
| 3.4.7 | $x^3 = -27$ $x = \sqrt[3]{-27}$ $x = -3 \checkmark \checkmark \mathbf{A}$ | Antwoord: 2 punte | (2) |
| 3.4.8 | $2^x = \frac{1}{64}$ $2^x = 2^{-6} \checkmark \mathbf{M}$ $x = -6 \checkmark \mathbf{A}$ | 2^{-6} : 1 punt Antwoord: 1 punt | (2) |
| 3.5.1 | $2x^3 - 3x^2 + 9x + 2$ $= 2(-2)^3 - 3(-2)^2 + 9(-2) + 2 \checkmark \mathbf{M}$ $= -16 - 12 - 18 + 2 \checkmark \mathbf{M}$ $= -44 \checkmark \mathbf{A}$ | Vervanging: 1 punt Vereenvoudig: 1 punt Antwoord: 1 punt | (3) |
| 3.5.2 | $\frac{5ac}{b}$ $= \frac{5(2)(\frac{-1}{2})}{(-3)} \checkmark \mathbf{M}$ | Vervanging: 1 punt Vereenvoudiging: 2 punte | |

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|--------------------|---|---|-----------------------------------|-----------------------------------|---|---|--------------------|-----|----------------|----|-----------------------------------|------------------|---|-----|-----------------------------------|-----------------------------------|-------------------|--|-----|
| | $\begin{aligned} &= \frac{5}{3} \checkmark \checkmark \mathbf{A} \\ &= 1\frac{2}{3} \end{aligned}$ | | | (3) | | | | | | | | | | | | | | | |
| 3.5.3 | $\begin{aligned} &3x^2 - 2xy - y^2 \\ &= 3(2)^2 - 2(2)(-3) - (-3)^2 \checkmark \mathbf{M} \\ &= 12 + 12 - 9 \checkmark \mathbf{M} \\ &= 15 \checkmark \mathbf{A} \end{aligned}$ | Vervanging: 1 punt Vereenvoudig: 2 punte Antwoord: 1 punt | | (3) | | | | | | | | | | | | | | | |
| 3.5.4 | $\begin{aligned} &2 \times 3^{1-x} \\ &= 2 \times 3^{1-(-2)} \mathbf{M} \\ &= 2 \times 3^3 \checkmark \mathbf{M} \\ &= 54 \checkmark \mathbf{A} \end{aligned}$ | Vereenvoudig: 1 punt Antwoord: 1 punt | | (2) | | | | | | | | | | | | | | | |
| 3.6.1 | <table border="1"><tr><td>Figuur</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Aantal swart teëls</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Aantal wit teëls</td><td>6</td><td>10</td><td><u>14</u> $\checkmark \mathbf{A}$</td><td><u>18</u> $\checkmark \mathbf{A}$</td></tr></table> | Figuur | 1 | 2 | 3 | 4 | Aantal swart teëls | 1 | 2 | 3 | 4 | Aantal wit teëls | 6 | 10 | <u>14</u> $\checkmark \mathbf{A}$ | <u>18</u> $\checkmark \mathbf{A}$ | Antwoord: 2 punte | | (2) |
| Figuur | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | |
| Aantal swart teëls | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | |
| Aantal wit teëls | 6 | 10 | <u>14</u> $\checkmark \mathbf{A}$ | <u>18</u> $\checkmark \mathbf{A}$ | | | | | | | | | | | | | | | |
| 3.6.2 | $Tn = 4n + 2$ | $4n$: 1punt 2: 1 punt | | (2) | | | | | | | | | | | | | | | |
| 3.7.1 | Driehoekgetalle $\checkmark \checkmark \mathbf{A}$ | Antwoord: 2 punte | | (2) | | | | | | | | | | | | | | | |
| 3.7.2 | $\begin{aligned} T_n &= \frac{n(n+1)}{2} \checkmark \checkmark \mathbf{A} \\ T_{20} &= \frac{20(20+1)}{2} \checkmark \mathbf{M} \\ T_{20} &= 210 \checkmark \mathbf{A} \end{aligned}$ | T_n : 2 punte Vervanging: 1 punt Antwoord: 1 punt | | (4) | | | | | | | | | | | | | | | |
| 3.8.1 | <table border="1"><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>y</td><td>-11</td><td>-8</td><td>-5</td><td>-2</td></tr></table> | x | -2 | -1 | 0 | 1 | y | -11 | -8 | -5 | -2 | 1 punt elk | | (4) | | | | | |
| x | -2 | -1 | 0 | 1 | | | | | | | | | | | | | | | |
| y | -11 | -8 | -5 | -2 | | | | | | | | | | | | | | | |
| 3.8.2 | <table border="1"><tr><td>x</td><td>-3</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>y</td><td>1</td><td>$-\frac{1}{3}$</td><td>-1</td><td>$-1\frac{2}{3}$ or $-\frac{5}{3}$</td></tr></table> | x | -3 | -1 | 0 | 1 | y | 1 | $-\frac{1}{3}$ | -1 | $-1\frac{2}{3}$ or $-\frac{5}{3}$ | 1 punt elk | | (4) | | | | | |
| x | -3 | -1 | 0 | 1 | | | | | | | | | | | | | | | |
| y | 1 | $-\frac{1}{3}$ | -1 | $-1\frac{2}{3}$ or $-\frac{5}{3}$ | | | | | | | | | | | | | | | |
| 3.9.1 | $x = 2 \checkmark \mathbf{A}$ | Antwoord: 1 punt | | (1) | | | | | | | | | | | | | | | |
| 3.9.2 | $y = 2x \checkmark \checkmark \mathbf{A}$ | Antwoord: 2 punte | | (2) | | | | | | | | | | | | | | | |
| 3.9.3 | CE = 6 eenhede $\checkmark \mathbf{A}$ | Antwoord: 1 punt | | (1) | | | | | | | | | | | | | | | |

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| 3.10.1 |  <p>X-afsnit: 1 punt per grafiek ✓+✓A Y-afsnit: 1 punt per grafiek ✓+✓A Korrekte benoeming van grafieke: 1 punt per grafiek ✓+✓A</p> | (6) |
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| 3.10.2 | Die lyne is loodreg. ✓ A | (1) |
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| 3.11 | P (3; 3) | Antwoord: 2 punte (2) |
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| 3.12.1 | <p>Gradiënt van $AD = \frac{4}{-2} = -2$. Vergelyking van AD is $y = -2x + 4$ ✓✓</p> <p>Gradiënt van $BC = \frac{4}{-2} = -2$ Vergelyking van BC is $y = -2x - 4$ ✓✓</p> | <p>$-2x$: 1 punt 4: 1 punt</p> <p>$-2x$: 1 punt -4: 1 punt</p> | (4) |
| 3.12.2 | $AD \parallel BC$ ✓ (omdat die gradiënt van $AD =$ gradiënt van BC) ✓ | <p>$AD \parallel BC$: 1 punt Rede : 1 punt</p> | (2) |

4. RUIMTE EN VORM

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|-----|---|--|---|-----|
| 4.1 | Bewering | Rede | Bewering: 1 punt Regte rede: 1 punt Antwoord vir x : 1 punt Bewering: 1 punt Regte rede: 1 punt | (5) |
| | $\hat{C}_1 = \hat{B}_2 + \hat{D}_1$ $75^\circ = x + 44^\circ \checkmark \mathbf{M}$ $\therefore x = 31^\circ \checkmark \mathbf{A}$ | buite \angle = som van teenoorst. binne $\angle e \checkmark \mathbf{A}$ of buite \angle van Δ | | |
| | $\hat{D}_2 = \hat{B}_2 = 31^\circ \mathbf{M}$ $\therefore y = 31^\circ \checkmark \mathbf{A}$ | Verw. $\angle e$ en $AD \parallel BC \mathbf{A}$ | | |

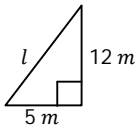
| | | | | |
|-----|--|---|---|-----|
| 4.2 | Bewering | Rede | Bewering: 1 punt Regte rede: 1 punt Bewering: 1 punt Regte rede: 1 punt Antwoord vir x : 1 punt Regte rede: 1 punt | (6) |
| | In ΔAEW : $\hat{E}_2 + \hat{W}_1 = 110^\circ \checkmark \mathbf{M}$ maar $\hat{E}_2 = \hat{W}_1 = 55^\circ \checkmark \mathbf{M}$ $\therefore x = \hat{E}_2 = 55^\circ \checkmark \mathbf{A}$ | som van $\angle e$ van $\Delta = 180^\circ \checkmark \mathbf{A}$ $\angle e$ teenoor van gelyke sye van $\Delta \checkmark \mathbf{A}$ verw. $\angle e$; $CS \parallel HW \checkmark \mathbf{A}$ | | |

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|-----|--|--|--|-----|
| 4.3 | Bewering | Rede | Bewering: 1 punt Regte rede: 1 punt Antwoord: 1 punt Bewering: 1 punt Regte rede: 1 punt Antwoord: 1 punt | (6) |
| | $\hat{E} = 95^\circ - 30^\circ \checkmark \mathbf{M}$ $= 65^\circ \checkmark \mathbf{A}$ of $\hat{C}_1 = 180^\circ - 95^\circ$ $= 85^\circ \checkmark \mathbf{M/A}$ $\hat{E} + 85^\circ + 30^\circ = 180^\circ$ $\hat{E} + 115^\circ = 180^\circ$ $\hat{E} = 65^\circ \checkmark \mathbf{A}$ | buite \angle van $\Delta CED \checkmark \mathbf{A}$ aangrensende suppl. $\angle e$ of $B\hat{C}E$ gestrekte hoek of $\angle e$ op reguit lyn. buite \angle van ΔCED som van $\angle e$ van $\Delta = 180^\circ \checkmark \mathbf{A}$ | | |
| | $\hat{A} + \hat{E} = 180^\circ \checkmark \mathbf{M}$ $\hat{A} = 115^\circ \checkmark \mathbf{A}$ | ko - binne $\angle e$ en $AB \parallel CD \checkmark \mathbf{A}$ | | |

| | | | | |
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| 4.4 | Bewering | Rede | Bewering: 1 punt Regte rede: 1 punt Bewering: 1 punt Regte rede: 1 punt Bewering: 1 punt Regte rede: 1 punt Bewering: 1 punt Regte afleiding: 1 punt | (8) |
| | In ΔABD en ΔCDB $BD = BD \checkmark \mathbf{M}$ $\hat{B}_2 = \hat{D}_1 = 90^\circ \checkmark \mathbf{M}$ $AD = CB \checkmark \mathbf{M}$ $\therefore \Delta ABD \equiv \Delta CDB \checkmark \mathbf{A}$ | gemeenskaplik $\checkmark \mathbf{A}$ gegee $\checkmark \mathbf{A}$ gegee $\checkmark \mathbf{A}$ $90^\circ, SS, s \checkmark \mathbf{A}$ | | |

| 4.5.1 | <table><tr><th>Bewering</th><th>Rede</th></tr><tr><td>$\hat{B}_1 + \hat{B}_2 + \hat{C}_1 + \hat{C}_2 = 180^\circ \checkmark \mathbf{M}$ Maar $\hat{B}_1 = \hat{B}_2$ and $\hat{C}_1 = \hat{C}_2 \checkmark \mathbf{M}$ $\therefore 2\hat{B}_1 + 2\hat{C}_1 = 180^\circ \checkmark \mathbf{A}$ $\hat{B}_1 + \hat{C}_1 = 90^\circ \checkmark \mathbf{A}$ $\therefore \hat{T}_2 = 90^\circ \checkmark \mathbf{A}$</td><td>ko-binne $\angle e$ en $AB \parallel DC \checkmark \mathbf{A}$ gegee som van $\angle e$ van $\Delta = 80^\circ \checkmark \mathbf{A}$ som van $\angle e$ van $\Delta = 80^\circ \checkmark \mathbf{A}$</td></tr></table> | Bewering | Rede | $\hat{B}_1 + \hat{B}_2 + \hat{C}_1 + \hat{C}_2 = 180^\circ \checkmark \mathbf{M}$ Maar $\hat{B}_1 = \hat{B}_2$ and $\hat{C}_1 = \hat{C}_2 \checkmark \mathbf{M}$ $\therefore 2\hat{B}_1 + 2\hat{C}_1 = 180^\circ \checkmark \mathbf{A}$ $\hat{B}_1 + \hat{C}_1 = 90^\circ \checkmark \mathbf{A}$ $\therefore \hat{T}_2 = 90^\circ \checkmark \mathbf{A}$ | ko-binne $\angle e$ en $AB \parallel DC \checkmark \mathbf{A}$ gegee som van $\angle e$ van $\Delta = 80^\circ \checkmark \mathbf{A}$ som van $\angle e$ van $\Delta = 80^\circ \checkmark \mathbf{A}$ | <div>Bewering: 1 punt Regte rede:1 punt Bewering: 1 punt Regte rede:1 punt Bewering: 1 punt Regte rede:1 punt Regte afleiding:1 punt Regte afleiding:1 punt</div> <div>(8)</div> |
|--|--|--|------|--|---|--|
| Bewering | Rede | | | | | |
| $\hat{B}_1 + \hat{B}_2 + \hat{C}_1 + \hat{C}_2 = 180^\circ \checkmark \mathbf{M}$ Maar $\hat{B}_1 = \hat{B}_2$ and $\hat{C}_1 = \hat{C}_2 \checkmark \mathbf{M}$ $\therefore 2\hat{B}_1 + 2\hat{C}_1 = 180^\circ \checkmark \mathbf{A}$ $\hat{B}_1 + \hat{C}_1 = 90^\circ \checkmark \mathbf{A}$ $\therefore \hat{T}_2 = 90^\circ \checkmark \mathbf{A}$ | ko-binne $\angle e$ en $AB \parallel DC \checkmark \mathbf{A}$ gegee som van $\angle e$ van $\Delta = 80^\circ \checkmark \mathbf{A}$ som van $\angle e$ van $\Delta = 80^\circ \checkmark \mathbf{A}$ | | | | | |
| 4.5.2 | <table><tr><th>Bewering</th><th>Rede</th></tr><tr><td>In ΔTCP en ΔBCT 1. $\hat{C}_2 = \hat{C}_1 \checkmark \mathbf{M}$ 2. $\hat{P}_2 = \hat{T}_2 \checkmark \mathbf{M}$ 3. $\hat{T}_1 = \hat{B}_1 \checkmark \mathbf{M}$ $\therefore \Delta TCP \parallel \Delta BCT \checkmark \mathbf{M}$</td><td>gegee $\checkmark \mathbf{A}$ beide $90^\circ \checkmark \mathbf{A}$ som van $\angle e$ van $\Delta = 180^\circ \checkmark \mathbf{A}$ $\angle \angle \angle \checkmark \mathbf{A}$</td></tr></table> | Bewering | Rede | In ΔTCP en ΔBCT 1. $\hat{C}_2 = \hat{C}_1 \checkmark \mathbf{M}$ 2. $\hat{P}_2 = \hat{T}_2 \checkmark \mathbf{M}$ 3. $\hat{T}_1 = \hat{B}_1 \checkmark \mathbf{M}$ $\therefore \Delta TCP \parallel \Delta BCT \checkmark \mathbf{M}$ | gegee $\checkmark \mathbf{A}$ beide $90^\circ \checkmark \mathbf{A}$ som van $\angle e$ van $\Delta = 180^\circ \checkmark \mathbf{A}$ $\angle \angle \angle \checkmark \mathbf{A}$ | <div>Bewering: 1 punt Regte rede:1 punt Bewering: 1 punt Regte rede:1 punt Bewering: 1 punt Regte rede:1 punt Bewering: 1 punt Regte rede:1 punt</div> <div>(8)</div> |
| Bewering | Rede | | | | | |
| In ΔTCP en ΔBCT 1. $\hat{C}_2 = \hat{C}_1 \checkmark \mathbf{M}$ 2. $\hat{P}_2 = \hat{T}_2 \checkmark \mathbf{M}$ 3. $\hat{T}_1 = \hat{B}_1 \checkmark \mathbf{M}$ $\therefore \Delta TCP \parallel \Delta BCT \checkmark \mathbf{M}$ | gegee $\checkmark \mathbf{A}$ beide $90^\circ \checkmark \mathbf{A}$ som van $\angle e$ van $\Delta = 180^\circ \checkmark \mathbf{A}$ $\angle \angle \angle \checkmark \mathbf{A}$ | | | | | |
| 4.5.3 | <table><tr><th>Bewering</th><th>Rede</th></tr><tr><td>$\frac{TC}{BC} = \frac{CP}{CT} = \frac{TP}{BT} \checkmark \mathbf{M}$ $\frac{TC}{2TC} = \frac{4}{BT} \checkmark \mathbf{M}$ $\frac{1}{2} = \frac{4}{BT} \checkmark \mathbf{A}$ $\therefore BT = 8 \text{ cm} \checkmark \mathbf{A}$</td><td>eweredige sye van gelykvormige $\Delta e \checkmark \mathbf{A}$ $BC = 2TC \checkmark \mathbf{A}$</td></tr></table> | Bewering | Rede | $\frac{TC}{BC} = \frac{CP}{CT} = \frac{TP}{BT} \checkmark \mathbf{M}$ $\frac{TC}{2TC} = \frac{4}{BT} \checkmark \mathbf{M}$ $\frac{1}{2} = \frac{4}{BT} \checkmark \mathbf{A}$ $\therefore BT = 8 \text{ cm} \checkmark \mathbf{A}$ | eweredige sye van gelykvormige $\Delta e \checkmark \mathbf{A}$ $BC = 2TC \checkmark \mathbf{A}$ | <div>Bewering: 1 punt Regte rede:1 punt Bewering: 1 punt Regte rede:1 punt Regte afleiding:1 punt Regte afleiding:1 punt</div> <div>(6)</div> |
| Bewering | Rede | | | | | |
| $\frac{TC}{BC} = \frac{CP}{CT} = \frac{TP}{BT} \checkmark \mathbf{M}$ $\frac{TC}{2TC} = \frac{4}{BT} \checkmark \mathbf{M}$ $\frac{1}{2} = \frac{4}{BT} \checkmark \mathbf{A}$ $\therefore BT = 8 \text{ cm} \checkmark \mathbf{A}$ | eweredige sye van gelykvormige $\Delta e \checkmark \mathbf{A}$ $BC = 2TC \checkmark \mathbf{A}$ | | | | | |
| 4.6.1 | <table><tr><th>Bewering</th><th>Rede</th></tr><tr><td>In ΔABD en ΔACD $AB = AC \checkmark \mathbf{M}$ $BD = CD \checkmark \mathbf{M}$ $AD = AD \checkmark \mathbf{M}$ $\therefore \Delta ABD \equiv \Delta ACD \checkmark \mathbf{A}$</td><td>gegee $\checkmark \mathbf{A}$ gegee $\checkmark \mathbf{A}$ gemeenskaplike sy $\checkmark \mathbf{A}$ s s s $\checkmark \mathbf{A}$</td></tr></table> | Bewering | Rede | In ΔABD en ΔACD $AB = AC \checkmark \mathbf{M}$ $BD = CD \checkmark \mathbf{M}$ $AD = AD \checkmark \mathbf{M}$ $\therefore \Delta ABD \equiv \Delta ACD \checkmark \mathbf{A}$ | gegee $\checkmark \mathbf{A}$ gegee $\checkmark \mathbf{A}$ gemeenskaplike sy $\checkmark \mathbf{A}$ s s s $\checkmark \mathbf{A}$ | <div>Bewering: 1 punt Regte rede:1 punt Bewering: 1 punt Regte rede:1 punt Bewering: 1 punt Regte rede:1 punt Regte afleiding:1 punt Regte rede:1 punt</div> <div>(8)</div> |
| Bewering | Rede | | | | | |
| In ΔABD en ΔACD $AB = AC \checkmark \mathbf{M}$ $BD = CD \checkmark \mathbf{M}$ $AD = AD \checkmark \mathbf{M}$ $\therefore \Delta ABD \equiv \Delta ACD \checkmark \mathbf{A}$ | gegee $\checkmark \mathbf{A}$ gegee $\checkmark \mathbf{A}$ gemeenskaplike sy $\checkmark \mathbf{A}$ s s s $\checkmark \mathbf{A}$ | | | | | |
| 4.6.2 | $\hat{A}_1 = \hat{A}_1$ $\therefore DA$ halfveer $\hat{B}\hat{A}\hat{C} \checkmark$ | <div>(ooreenst. $\angle e$ van kongruente Δe) \checkmark</div> <div>(2)</div> | | | | |

5. METING

| | | | | |
|-----|--|---|---|-----|
| 5.1 | <p>Laat die lengte van die leer = l.</p> $l^2 = 12^2 + 5^2 m^2 \quad (\text{Pyth}) \checkmark \checkmark \mathbf{M}$ $l^2 = 169 m^2 \quad \checkmark \mathbf{A}$ $l = 13 m \quad \checkmark \mathbf{A}$ |  | <p>Formule/vervanging: 2 punte Bewerking: 1 punt Antwoord: 1 punt</p> | (4) |
|-----|--|---|---|-----|

| | | | |
|-------|---|--|-----|
| 5.2.1 | $PS^2 = AP^2 - AS^2$ $= (25 - 4) m^2 \checkmark \mathbf{M} \quad \text{Pyth } \checkmark \mathbf{A}$ $PS = 4,58 m \checkmark \mathbf{A}$ | <p>Formule/ vervanging: 1 punt Rede: 1 punt Antwoord: 1 punt</p> | (3) |
| 5.2.2 | $PT = 3 \times AB = 12 m \checkmark \mathbf{A}$ | Antwoord: 1 punt | (1) |
| 5.2.3 | Vliëer | Antwoord: 1 punt | (1) |
| 5.2.4 | <p>Oppervlak van die vliëer = $\frac{1}{2} \times PT \times AB \checkmark \mathbf{M}$ or $\frac{PT \times AB}{2}$</p> $= \frac{1}{2} \times 12 m \times 4 m \checkmark \mathbf{M}$ $= 24 m^2 \checkmark \mathbf{A}$ | <p>Formule: 1 punt Vervanging: 1 punt Antwoord: 1 punt</p> | (3) |

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|-------|---|---|-----|
| 5.3.1 | <p>Omtrek = $2 \times 100 m + 2\pi r$</p> $= 200 m \checkmark + 2 \times 3,14 \times 30 m \checkmark \mathbf{M}$ $\approx 388,4 m \checkmark \mathbf{KA}$ <p>\therefore Aantal rondtes = $4\,000 m \div 388,5 m \checkmark \mathbf{M}$</p> $= 10,298661$ <p>Peter moet 11 keer om die baan hardloop. $\checkmark \mathbf{KA}$</p> | <p>Formule/ vervanging: 2 punte Antwoord: 1 punt</p> <p>Bewerking: 1 punt</p> <p>Antwoord: 1 punt</p> | (5) |
| 5.3.2 | <p>Oppervlakte = $l \times b + \pi r^2$</p> $= 60 m \times 100 m + 3,14 \times 60^2 m^2 \checkmark \checkmark \mathbf{M}$ $= 6\,000 m^2 + 11\,304 m^2$ $= 17\,304 m^2 \checkmark \mathbf{A}$ | <p>Formule/ vervanging: 2 punte</p> <p>Antwoord: 1 punt</p> | (3) |