Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

GRADE/*GRAAD* 12

JUNE/*JUNIE* 2026

MATHEMATICS P1 MARKING GUIDELINE/ *WISKUNDE V1 NASIENRIGLYN*

MARKS/*PUNTE*: 150

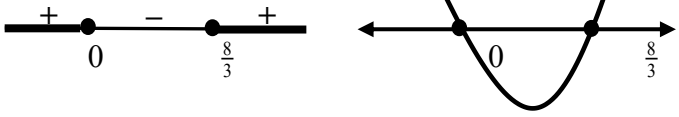
This marking guideline consists of 19 pages./
Hierdie nasienriglyn bestaan uit 19 *bladsye*.

NOTE/*LET WEL*:

- If a candidate answered a question TWICE, mark the FIRST attempt ONLY.
  Indien 'n kandidaat 'n vraag TWEE keer beantwoord, merk SLEGS die EERSTE poging.
- Consistent accuracy(CA) applies in ALL aspects of the marking guideline.
  Volgehoue akkuraatheid geld deurgaans in ALLE aspekte van die nasienriglyn.
- If a candidate crossed out an attempt of a question and did not redo the question, mark the crossed-out attempt.
  Indien 'n kandidaat 'n poging vir 'n vraag deurgetrek het en nie die vraag weer beantwoord het nie, merk die poging wat deurgetrek is.
- The mark for substitution is awarded for substitution into the correct formula.
  Die punt vir substitusie word toegeken vir substitusie in die korrekte formule.

QUESTION/*VRAAG 1*

1.1.1	$x(x-3)+2(x-3)=0$ $(x-3)(x+2)=0$ $x-3=0$ or/*of* $x+2=0$ $x=3$ or/*of* $x=-2$ Answers only – Full Marks / *Slegs antwoorde - Volpunte*	✓ factors / *faktore* ✓ both answers / *beide antwoorde* (2)
1.1.2	$3x^2-5x-4=0$ $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ $x=\frac{-(-5)\pm\sqrt{(-5)^2-4(3)(-4)}}{2(3)}$ $x=\frac{5\pm\sqrt{73}}{6}$ $\therefore x=-0,59$ or / *of* $x=2,26$ Penalise 1 mark for incorrect rounding off./ *Penaliseer* 1 *punt vir verkeerde afronding.*	✓ substitution / *vervanging* ✓✓ x-values / *x-waardes* (3)

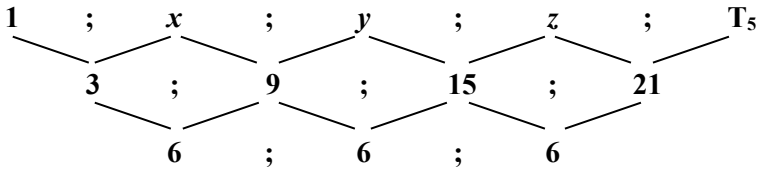
1.1.3	$3x^2 - 8x \geq 0$ $x(3x-8) \geq 0$ critical values/*kritieke waardes* $x = 0$ or/*of* $x = \frac{8}{3}$  $x \leq 0$ *or / of* $x \geq \frac{8}{3}$, $x \in \mathbf{R}$ **OR/*OF*** $x \in (-\infty\ ;\ 0]$ *or / of* $x \in \left[\frac{8}{3}\ ;\ \infty\right)$, $x \in \mathbf{R}$	✓ factors / *faktore* ✓ critical values / *kritieke waardes* ✓✓ $x \leq 0$ *or / of* $x \geq \frac{8}{3}$, $x \in \mathbf{R}$ (accuracy / *akkuraatheid*) **OR/*OF*** $x \in (-\infty\ ;\ 0]$ *or / of* $x \in \left[\frac{8}{3}\ ;\ \infty\right)$, $x \in \mathbf{R}$ (4)
1.1.4	$\frac{3}{2x} = \sqrt{\frac{6}{x}} - 1$ $\frac{3}{2x} + 1 = \sqrt{\frac{6}{x}}$ $\left(\frac{3}{2x} + 1\right)^2 = \left(\sqrt{\frac{6}{x}}\right)^2$ $\frac{9}{4x^2} + \frac{3}{x} + 1 = \frac{6}{x}$ $9 + 12x + 4x^2 = 24x$ $4x^2 - 12x + 9 = 0$ $(2x-3)(2x-3) = 0$ $\therefore\ x = \frac{3}{2}$	✓ isolating surd / *isoleer wortelvorm* ✓ idea of squaring both sides / *idee om albei kante te kwadreer* ✓ *actual squaring / kwadrering* ✓ standard form / *standaardvorm* ✓ answer / *antwoord* (5)

1.2	$y = 3x - 1$ ....(1) $x^2 + 2xy = 3y^2 - 7$ .....(2) (1) into/*in* (2): $x^2 + 2x(3x-1) = 3(3x-1)^2 - 7$ $x^2 + 6x^2 - 2x = 27x^2 - 18x + 3 - 7$ $20x^2 - 16x - 4 = 0$ $5x^2 - 4x - 1 = 0$ $(5x+1)(x-1) = 0$ $5x + 1 = 0$ or/*of* $x - 1 = 0$ $x = -\frac{1}{5}$ or/*of* $x = 1$ $y = -\frac{8}{5}$ or/*of* $y = 2$	✓ $y = 3x - 1$ ✓ substitution / *vervanging* ✓ expanding / *uitbreiding* ✓ standard form / *standaardvorm* ✓ *x*-values / *waardes* ✓ *y*-values / *waardes* (6)
1.3	$x + y = 4$ $x^2 + 2xy + y^2 = 16$ $x^2 + y^2 = 14 \ldots\ldots\ldots (1)$ $x^3 + y^3 = (x+y)(x^2 - xy + y^2)$ $= (4)(14 - 1)$ $= 52$ **OR / *OF*** $(x+y)^3 = (4)^3$ $(x+y)(x^2 + 2xy + y^2) = 64$ $x^3 + 3x^2y + 3xy^2 + y^3 = 64$ $x^3 + y^3 + 3xy(x+y) = 64$ $x^3 + y^3 + 3(1)(4) = 64$ $x^3 + y^3 = 52$	✓ square both sides / *kwadreer beide kante* ✓ $x^2 + y^2 = 14$ ✓ sum of cubes factors / *som van derdemagte faktore* ✓ answer / *antwoord* (4) **OR / *OF*** ✓ cube both sides / *derdemag beide kante* ✓ expansion / uitbreiding ✓ grouping / *groepering* ✓ answer / *antwoord* (4)
		[24]

QUESTION/*VRAAG 2*

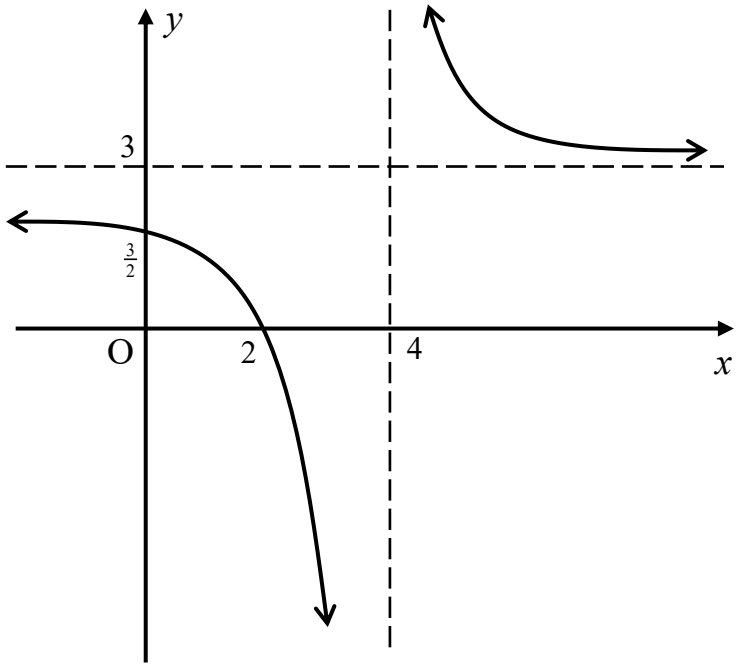
2.1.1	$\frac{p}{p+3}=\frac{p-2}{p}$ $p^2=p^2+p-6$ $\therefore\ p=6$	✓ equating ratios / *gelykstel van verhoudings* ✓ simplification / *vereenvoudiging* ✓ answer / *antwoord* (3)
2.1.2	9 ; 6 ; 4 ; . . . $r=\frac{2}{3}$ $\therefore\ -1<\frac{2}{3}<1$	✓ value of *r* / *waarde van r* ✓ reason / *rede* (2)
2.1.3	$S_\infty=\frac{a}{1-r}$ $=\frac{9}{1-\frac{2}{3}}$ $=27$	✓ substitution / *vervanging* ✓ answer / *antwoord* (2)
2.2.1	$2.3^{n-1}=13122$ $3^{n-1}=6561=3^8$ $\therefore\ n-1=8$ $n=9$ $\therefore\ \sum_{n=1}^{9}2.(3)^{n-1}$	✓ equating / *geslykstelling* ✓ value of n / *waarde van n* ✓ answer / *antwoord* (3)
2.2.2	$S_n=\frac{a(r^n-1)}{r-1}$ $=\frac{2(3^9-1)}{3-1}$ $=19\,682$	✓ substitution / *vervanging* ✓ answer / *antwoord* (2)
		[12]

QUESTION/*VRAAG 3*

3.1.1	 $T_2 = 4$ and / *en* $T_3 = 13$	✓ 1st differences / 1ste *verskille* ✓ answer / *antwoord* (2)
3.1.2	$2a = 6$ $\quad 3a + b = 3$ $\quad a + b + c = 1$ $a = 3$ $\quad 3(3) + b = 3$ $\quad 3 - 6 + c = 1$ $b = -6$ $\quad c = 4$ $\therefore\ T_n = 3n^2 - 6n + 4$	✓ value of a / *waarde van a* ✓ value of b / *waarde van b* ✓ value of c / *waarde van c* (3)
3.2	$12 - d\ ;\ 12\ ;\ 12 + d$ *Applying Pythagoras* : $(12 + d)^2 = (12)^2 + (12 - d)^2$ $144 + 24d + d^2 = 144 + 144 - 24d + d^2$ $48d = 144$ $d = 3$ $\therefore$ *short side* $= 9$ $\therefore$ *hypotenuse* $= 15$	✓ sequence in terms of d / *ry in terme van d* ✓ use of Pythagoras / *gebruik van Pythagoras* ✓ value of d / *waarde van d* ✓ answers / *antwoorde* (4)

3.3	$\sum_{p=5}^{20}(p+1)^2-\sum_{p=5}^{20}(p^2)$ $=\left(6^2+7^2+\ldots+21^2\right)-\left(5^2+6^2+\ldots+20^2\right)$ $=21^2-5^2$ $=416$	✓ expanding / *uitbreiding* ✓ expanding / *uitbreiding* ✓ simplification / *vereenvoudiging* ✓ answer / *antwoord*
	OR / *OF* $\sum_{p=5}^{20}(p+1)^2-\sum_{p=5}^{20}(p^2)$ $=\sum_{5}^{20}(2p+1)$ $=11+13+15+\ldots+41$	**OR / *OF*** ✓ combining Sigma notation *kombineer Sigma notasie* ✓ expanding / *uitbreiding*
	$\therefore\ S_{16}=\frac{16}{2}(11+41)$ $=416$	✓ substitution / *vervanging* ✓ answer / *antwoord*
	OR / *OF* $36+49+64+....+441$ $S_{16}=\frac{16}{2}(36+441)=3816$	**OR / *OF*** ✓ expanding / *uitbreiding*
	$25+36+49+.....+400$ $S_{16}=\frac{16}{2}(25+400)=3400$	✓ expanding / *uitbreiding* ✓ both sums / *beide somme*
	$3816-3400$ $=416$	✓ answer / *antwoord*
		(4)
		[13]

QUESTION/*VRAAG 4*

4.1	$x \neq 4; x \in \mathbb{R}$	✓ answer / *antwoord* (1)
4.2	$y = 3$	✓ answer / *antwoord* (1)
4.3	$f(0) = \frac{6}{0-4} + 3$ $= \frac{3}{2}$ $\frac{6}{x-4} + 3 = 0$ $6 = -3x + 12$ $3x = 6$ $x = 2$	✓ answer / *antwoord* ✓ $y = 0$ ✓ answer / *antwoord* (3)
4.4		✓ *x*- & *y*-intercepts *x*- & *y-afsnitte* ✓ asymptotes / *asimptote* ✓ shape / *vorm* (3)
4.5	$2 \leq x < 4$	✓✓ answer / *antwoord* (2)
		[10]

QUESTION/*VRAAG 5*

5.1.1	$x = \frac{-b}{2a}$ $= \frac{-8}{2(-2)}$ $= 2$ $y = -2(2)^2 + 8(2) + 10$ $= 18$ A(2 ; 18)	✓ *x*-value / *x-waarde* ✓ *y*-value / *y-waarde* (2)
5.1.2	$-2x^2 + 8x + 10 = 0$ $(-2x + 10)(x + 1) = 0$ $x = 5$ *or / of* $x = -1$ $\therefore$ $BC = 6$ units / *eenhede*	✓ equating to 0 / gelyk stel aan 0 ✓ *x*-intercepts / *x-afsnitte* ✓ answer / *antwoord* (3)
5.2	$m_g = \frac{-14-0}{6+1} = -2$ $y - 0 = -2(x+1)$ **OR/OF** $y = -2x - 2$ $m = \frac{-14-0}{6+1} = -2$ $y = -2x + c$ $0 = 2(-1) + c$ $c = -2$ $\therefore y = -2x - 2$	✓ gradient / *gradiënt* ✓ equation / *vergelyking* (2)

5.3	$f'(x) = -4x + 8 = -8$ $-4x = -16$ $x = 4$ $y = -2(4)^2 + 8(4) + 10$ $= 10$ $y = -8x + k$ $10 = -8(4) + k$ $k = 42$ **OR/OF** $-2x^2 + 8x + 10 = -8x + k$ $-2x^2 + 16x + 10 - k = 0$ tangent with one real root: / *raaklyn met een reële wortel* (equal roots) / (*gelyke wortels*) $b^2 - 4ac = 0$ $(16)^2 - 4(-2)(10 - k) = 0$ $256 + 8(10 - k) = 0$ $256 + 80 - 8k = 0$ $-8k = -336$ $k = 42$ $\therefore h(x) = -8x + 42$	✓ equating f' to -8 / *stel f' gelyk aan -8* ✓ $x = 4$ and/en $y = 10$ ✓ substituting point / *vervanging van punt* ✓ answer / *antwoord* **OR/*OF*** ✓ equating f to h / *stel f gelyk aan h* ✓ standard form / *standaardvorm* ✓ substitution into delta / *vervanging in delta* ✓ answer / *antwoord* (4)
5.4	$f(x) = -2(x+1)^2 + 8(x+1) + 10$ $= -2x^2 - 4x - 2 + 8x + 8 + 10$ $= -2x^2 + 4x + 16$ **OR/*OF*** $A(2;18)$ and/*en* $a = -2$ $f(x) = -2(x-2)^2 + 18$ $f(x+1) = -2(x+1-2)^2 + 18$ $= -2(x-1)^2 + 18$	✓ replace x with $(x + 1)$ vervang x met $(x + 1)$ ✓ answer / *antwoord* **OR/*OF*** ✓ replace x with $(x + 1)$ *vervang x met $(x + 1)$* ✓ answer / *antwoord* (2)

5.5	$p > 11$	✓✓ answer / *antwoord* (2)

Few approaches for teaching and learning / *Paar benaderings vir onderrig en leer*

Option 1 / *Opsie* 1

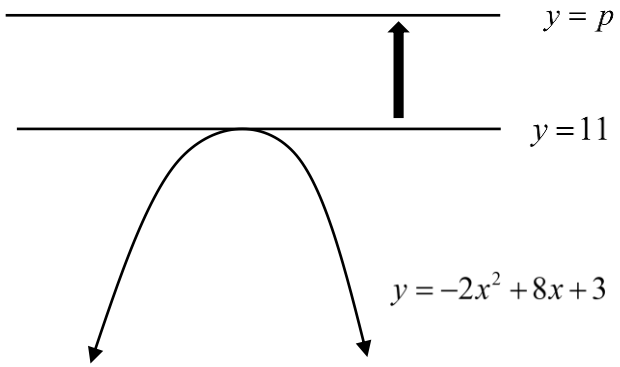
$$x = -\frac{8}{2(-2)} = 2$$

$$y = -(2)^2 + 8(2) + 3$$

$$= 11$$

$\text{T.P}(2;11)$

$\therefore p > 11$



Option 2 / *Opsie* 2

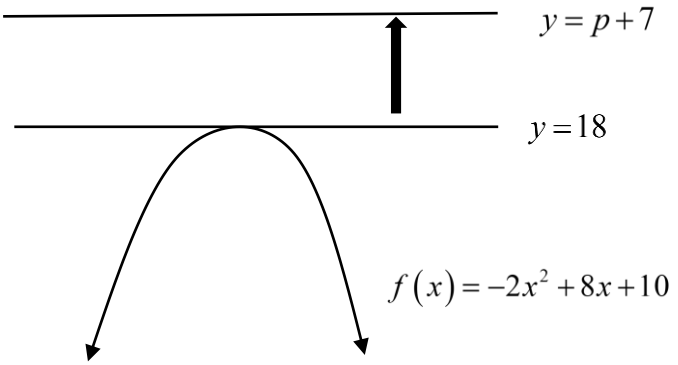
$$-2x^2 + 8x + 3 = p$$

$$-2x + 8x + 10 = p + 7$$

For non-real :

$p + 7 > 18$

$\therefore p > 11$



Option 3 / *Opsie* 3

$$-2x^2 + 8x + 3 - p = 0$$

For non-real: / *Vir nie - reëel*:

$$b^2 - 4ac < 0$$

$$(8)^2 - 4(-2)(3 - p) < 0$$

$$64 + 24 - 8p < 0$$

$$-8p < -88$$

$\therefore p > 11$

[15]

QUESTION/*VRAAG 6*

6.1	$y = \log_a x$ $-1 = \log_a\left(\frac{1}{2}\right)$ $\frac{1}{a} = \frac{1}{2}$ $\therefore\ a = 2$	✓ substitution / *vervanging* ✓ answer / *antwoord* (2)
6.2	$f: y = \log_2 x$ $f^{-1}: x = \log_2 y$ $\therefore\ y = 2^x$	✓ swopping x and y / *omruil van x en y* ✓ answer / *antwoord* (2)
6.3.1	$g(x) = -\log_2 x$ **OR/*OF*** $g(x) = \log_{\frac{1}{2}} x$	✓ answer / *antwoord* (1)
6.3.2	decreasing / *dalend*	✓ answer / *antwoord* (1)
6.4	$0 < x < \frac{1}{2}$	✓✓ answer / *antwoord* (2)
		[8]

QUESTION/*VRAAG 7*

7.1	$A = P(1+i)^{12n}$ $10\,000 = 5\,000\left(1+\frac{9\%}{12}\right)^{12n}$ $2 = (1,0075)^{12n}$ $\therefore\ 12n = \log_{1,0075}(2)$ $12n = 92,76$ *months / maande* $n = 7,73$ *years / jare*	✓ substitution / *vervanging* ✓ simplification / *vereenvoudiging* ✓ use of logs / *gebruik van logs* ✓ answer / *antwoord* (4)
7.2	$1+i_{eff} = \left(1+\frac{i_{nom}}{m}\right)^{m}$ $1+12,13\% = \left(1+\frac{i_{nom}}{12}\right)^{12}$ $\sqrt[12]{(1+12,13\%)} = 1+\frac{i_{nom}}{12}$ $\therefore\ i_{nom} = 12\left(\sqrt[12]{(1+12,13\%)}\right)-1$ $= 0,11503662039$ $\Rightarrow$ nominal rate = 11,50 p.a compounded monthly *nominale koers = 11,50 p.j maandeliks saamgestel*	✓ substitution / *vervanging* ✓ subject of the formula / *onderwerp van die formule* ✓ answer / *antwoord* (3)
7.3.1	$A = P(1+i)^{n}$ $= 20\,000\left(1+\frac{7,2\%}{4}\right)^{8}$ $= R\,23\,068,12$	✓ substitution / *vervanging* ✓ answer / *antwoord* (2)
7.3.2	$A = \left[23\,068,12\left(1+\frac{7,8\%}{12}\right)^{24} - x\right]\left(1+\frac{7,8\%}{12}\right)^{36}$ $30\,871,61 = 23\,068,12\left(1+\frac{7,8\%}{12}\right)^{60} - x\left(1+\frac{7,8\%}{12}\right)^{36}$ $x\left(1+\frac{7,8\%}{12}\right)^{36} = 23\,068,12\left(1+\frac{7,8\%}{12}\right)^{60} - 30\,871,61$ $x = \frac{23\,068,12\left(1+\frac{7,8\%}{12}\right)^{60} - 30\,871,61}{\left(1+\frac{7,8\%}{12}\right)^{36}}$ $x = R\,2\,500,00$	✓ $23\,068,12\left(1+\frac{7,8\%}{12}\right)^{24}$ ✓ multiply by $\left(1+\frac{7,8\%}{12}\right)^{36}$ ✓ expanding / *uitbreiding* ✓ *x* subject of the formula/ *x onderwerp van die formule* ✓ answer / *antwoord* (5)
		[14]

QUESTION/*VRAAG 8*

Penalise 1 mark for incorrect notation in 8.1 only
Penaliseer 1 punt vir verkeerde notasie, slegs in 8.1

8.1

$$f'(x) = \lim_{h\to 0}\frac{f(x+h)-f(x)}{h}$$

$$= \lim_{h\to 0}\frac{5(x+h)^2+1-(5x^2+1)}{h}$$

$$= \lim_{h\to 0}\frac{5x^2+10xh+5h^2+1-5x^2-1}{h}$$

$$= \lim_{h\to 0}\frac{10xh+5h^2}{h}$$

$$= \lim_{h\to 0}\frac{h(10x+5h)}{h}$$

$$= \lim_{h\to 0}(10x+5h)$$

$$= 10x$$

Answer ONLY: 0 marks
SLEGS antwoord: 0 *punte*

✓ substitution / *vervanging*

✓ simplification / *vereenvoudiging*

✓ factorisation / *faktorisering* (dividing by h / *deel deur* h)

✓ answer / *antwoord*

(4)

8.2.1

$$\frac{dy}{dx} = 6x^2 - \frac{1}{5}$$

✓ $6x^2$

✓ $\frac{1}{5}$

(2)

8.2.2

$$D_x\left[\frac{\sqrt{x^5}+5}{x^2}\right]$$

$$= D_x\left[\frac{x^{\frac{5}{2}}}{x^2}+\frac{5}{x^2}\right]$$

$$= D_x\left[x^{\frac{1}{2}}+5x^{-2}\right]$$

$$= \frac{1}{2}x^{-\frac{1}{2}} - 10x^{-3}$$

✓ $x^{\frac{1}{2}}$ ✓ $5x^{-2}$

✓ $\frac{1}{2}x^{-\frac{1}{2}}$ ✓ $-10x^{-3}$

(4)

8.3

$$h(-1) = 3(-1)^2 + 4(-1)$$
$$= -1$$
$$T(-1\,;-1)$$

$$m = f'(x) = 6(-1)+4 = -2$$

$$y+1 = -2(x+1)$$
$$y = -2x-3$$

✓ coordinates of T / *koördinate van* T

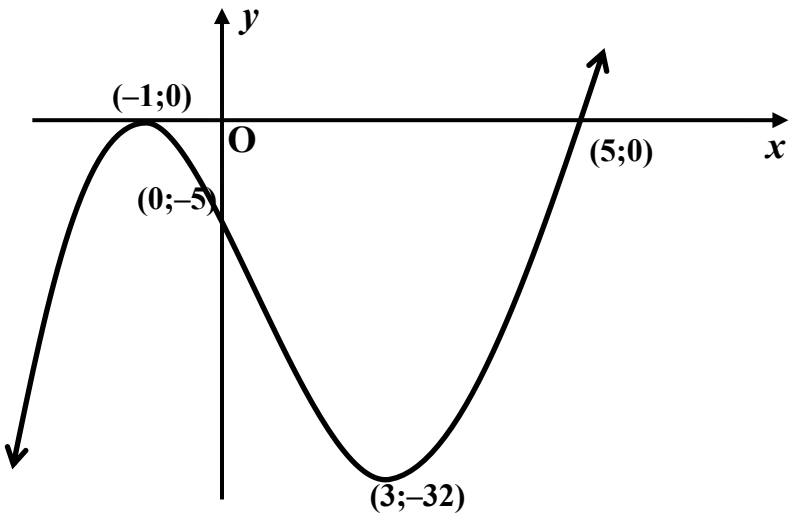
✓ derivative = $6x + 4$/ *afgeleide* = $6x + 4$

✓ $m = -2$
✓substitution of m = -2 # point(-1; -1)
✓ answer / *antwoord*

(5)

[15]

QUESTION/*VRAAG 9*

9.1	$f(x) = x^3 - 3x^2 - 9x - 5$ $f(-1) = (-1)^3 - 3(-1)^2 - 9(-1) - 5$ $= -1 - 3 + 9 - 5$ $= 0$ $\therefore (x + 1)$ is a factor./*is 'n faktor*	✓ substitution of –1 and getting to 0 / *vervanging van –1 en kry gelyk aan 0* (1)
9.2	y-int: (let $x = 0$) $\Rightarrow y = -5$ x-ints: (let $y = 0$): $f(x) = x^3 - 3x^2 - 9x - 5 = 0$ $(x+1)(x^2 - 4x - 5) = 0$ $(x+1)(x+1)(x-5) = 0$ $\therefore\ x = -1$ or / *of* $x = -1$ or / *of* $x = 5$	✓ y-intercept / *y-afsnit* ✓ quadratic bracket / *kwadratiese hakkie* ✓ x-intercepts / *x-afsnitte* (3)
9.3	$f(x) = x^3 - 3x^2 - 9x - 5$ $f'(x) = 3x^2 - 6x - 9 = 0$ $x^2 - 2x - 3 = 0$ $(x+1)(x-3) = 0$ $x = -1$ or / *of* $x = 3$ $y = 0$ or / *of* $y = -32$ $P(-1\ ;\ 0)$; $Q(3\ ;\ -32)$	✓ $f'(x) = 0$ ✓ x-values / *x-waardes* ✓ y-values / *y-waardes* (3)
9.4	 	✓ x- and y- intercepts *x- en y- afsnitte* ✓ turning points / *draaipunte* ✓ shape / *vorm* (3)

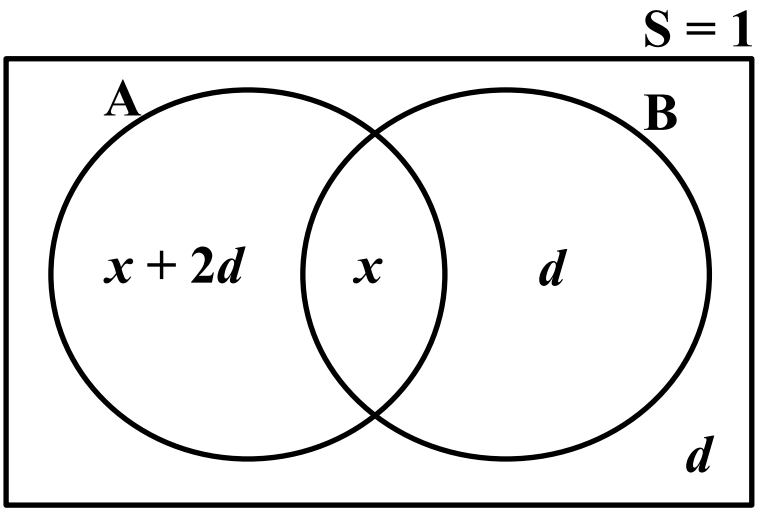
9.5.1	$x < -1$ or / *of* $x > 3$ Accept/*Aanvaar*: $x \leq -1$ or / *of* $x \geq 3$	✓✓ answer / *antwoord* (2)
9.5.2	$f''(x) > 0$ $6x - 6 > 0$ $6x > 6$ $\therefore\ x > 1$ ***OR / OF*** $x = \frac{-1+3}{2} = 1$ $\therefore\ x > 1$ **OR / *OF*** $x > 1$ (answer only / *slegs antwoord*)	✓ method / *metode* ✓ answer / *antwoord* **OR / *OF*** ✓ method / *metode* ✓ answer / *antwoord* **OR / *OF*** ✓✓ answer / *antwoord* (2)
9.5.3	$-1 < x < 3$ or / *of* $x > 5$	✓✓ answer / *antwoord* (2)
		[16]

QUESTION/*VRAAG 10*

10.	$d = 0$ (h passes through origin / *h gaan deur oorsprong*) $\therefore\ h(x) = -x^3 + bx^2 + cx$ $-\frac{7}{2} = -(-1)^3 + b(-1)^2 + c(-1)$ $-9 = 2b - 2c$ .....(1) $h'(x) = -3x^2 + 2bx + c$ $h'(-1) = -3(-1)^2 + 2b(-1) + c = 0$ $3 = -2b + c$ .....(2) $(1) + (2):\quad -c = -6 \quad \Rightarrow \quad c = 6$ $3 = -2b + 6$ $\therefore\ b = \frac{3}{2}$	✓ substitution into $h(x)$/*vervanging* in $h(x)$ ✓ equation 1 / *vergelyking 1* ✓ $h'(x)$ ✓ substitution and equating to 0 / *vervanging en gelykstel aan 0* ✓ equation 2 / *vergelyking 2* ✓ value of c / *waarde van c* ✓ value of b / *waarde van b*
		[7]

QUESTION/*VRAAG 11*

11.1.1	$P(A \text{ or / } of\ B) = 1 - P(A \text{ or / } of\ B)'$ $= 1 - 0,2775$ $= 0,7225$	✓ answer / *antwoord* (1)
11.1.2	$P(A \text{ or / } of\ B) = 0,7225$ $P(A) + P(B) = 0,63 + 0,25 = 0,88$ $\therefore\ P(A \text{ or / } of\ B) \neq P(A) + P(B)$ $\Rightarrow$ not mutually exclusive / *nie onderling uitsluitend* **OR/*OF*** $P(A \text{ and / } en\ B) = P(A) + P(B) - P(A \text{ or / } of\ B)$ $= 0,63 + 0,25 - 0,7225$ $= 0,1575$ $\therefore\ P(A \text{ and / } en\ B) \neq 0$ $\Rightarrow$ not mutually exclusive / *nie onderling uitsluitend*	✓ calculation to support answer *berekening om antwoord te staaf* ✓ answer / *antwoord* **OR/*OF*** ✓ calculation to support answer *berekening om antwoord te staaf* ✓ answer / *antwoord* (2)
11.1.3	$P(A) \times P(B) = 0,63 \times 0,25 = 0,1575$ $P(A \text{ and / } en\ B) = 0,1575$ (*from / vanaf* 11.1.2) $\therefore\ P(A \text{ and / } en\ B) = P(A) \times P(\text{B})$ $\Rightarrow$ events are independent / *gebeurtenisse is onafhanklik*	✓ calculation to support answer/ *berekening om antwoord te staaf* ✓ answer / *antwoord* (2)
11.2.1	(i) $= \frac{6}{10}$ *and / en* (ii) $= \frac{4}{10}$ (iii) $= \frac{6}{8}$ *and / en* (iv) $= \frac{2}{8}$	✓ $\frac{6}{10}$ *and / en* $\frac{4}{10}$ ✓ $\frac{6}{8}$ *and / en* $\frac{2}{8}$ (2)
11.2.2 (a)	$\left(\frac{6}{10} \times \frac{4}{10} \times \frac{3}{9}\right) + \left(\frac{4}{10} \times \frac{6}{9} \times \frac{3}{9}\right)$ $= \frac{2}{25} + \frac{4}{45}$ $= 0,08 + 0,0\dot{8}$ $= 0,17$	✓ adding of branches *optel van takke* ✓ answer / *antwoord* (2)

11.2.2 (b)	$P(\text{atleastoneblue}) = 1 - P(\text{allwhite})$ $P(\text{tenminsteeenblou}) = 1 - P(\text{almalwit})$ $= 1 - \left(\frac{6}{10} \times \frac{6}{10} \times \frac{6}{10}\right)$ $= 0{,}784$	✓ using rule / *gebruik van reël* ✓ answer / *antwoord* (2)
11.3.1		✓ P(A or/*of* B)′ = *d* **and/en** P(A and/*en* B) = *x* ✓ P(only/*slegs* A) = *x* + 2*d* ✓ P(B) = *d* (3)
11.3.2	$x + 2d + x + d + d = 1$ $2x + 4d = 1$ $x + 2d = \frac{1}{2}$ $P(\text{only / } slegs\ A) = \frac{1}{2} / 0{,}5$	✓ equation / *vergelyking* ✓ answer / *antwoord* (2)
		[16]
		TOTAL/*TOTAAL*: 150