basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NASIONALE SENIOR SERTIFIKAAT

GRAAD 12

WISKUNDE V1

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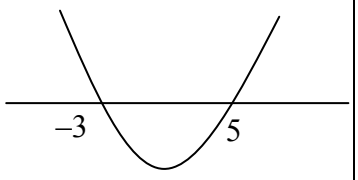
MEMORANDUM

PUNTE: 150

Hierdie memorandum bestaan uit 20 bladsye.

Kopiereg voorbehou

VRAAG 1

1.1.1	$3x^2 - 5x = 2$ $3x^2 - 5x - 2 = 0$ $(3x+1)(x-2) = 0$ $x = -\frac{1}{3}$ of $x = 2$	✓ standaardvorm ✓ faktore ✓ beide antwoorde (3)
1.1.2	$x - \frac{2}{x} = 5$ $x^2 - 2 = 5x$ $x^2 - 5x - 2 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{-(-5) \pm \sqrt{25 - 4(1)(-2)}}{2(1)}$ $x = \frac{5 \pm \sqrt{33}}{2}$ $x = 5{,}37$ of $x = -0{,}37$	✓ standaardvorm ✓ subs in korrekte formule ✓✓ antwoorde (een vir elke antwoord) (4)
1.1.3	$(x+1)(x-3) > 12$ $x^2 - 2x - 3 > 12$ $x^2 - 2x - 15 > 0$ $(x-5)(x+3) > 0$ + 0 − 0 + OF −3 5  $x < -3$ of $x > 5$	✓ vermenigvuldiging ✓ faktore ✓✓ antwoorde (4)

1.2	$r + p = 2$ $r = 2 - p$ $6r + 5rp - 5p = 8$ $6(2 - p) + 5(2 - p)p - 5p = 8$ $12 - 6p + 10p - 5p^2 - 5p = 8$ $5p^2 + p - 4 = 0$ $(5p - 4)(p + 1) = 0$ $p = \frac{4}{5}$ of $p = -1$ $r = 2 - \left(\frac{4}{5}\right)$ of $r = 2 - (-1)$ $r = \frac{6}{5}$ $r = 3$ **OF** $r + p = 2$ $p = 2 - r$ $6r + 5rp - 5p = 8$ $6r + 5r(2 - r) - 5(2 - r) = 8$ $6r + 10r - 5r^2 - 10 + 5r = 8$ $5r^2 - 21r + 18 = 0$ $(5r - 6)(r - 3) = 0$ $r = \frac{6}{5}$ of $r = 3$ $p = 2 - \left(\frac{6}{5}\right)$ of $p = 2 - (3)$ $p = \frac{4}{5}$ $p = -1$	✓ $r = 2 - p$ ✓ substitusie ✓ vereenvoudiging ✓ faktore ✓ *p*-antwoorde ✓✓ *r*-antwoorde (7) ✓ $p = 2 - r$ ✓ substitusie ✓ standaardvorm ✓ faktore ✓ *r*-antwoorde ✓✓ *p*-antwoorde (7)
1.3	Laat die kortste sy x wees. Sye van die prisma: x ; $2x$; $3x$ Volume = lbh $(x)(2x)(3x) = 3\,072$ $6x^3 = 3\,072$ $x^3 = 512$ $x = \sqrt[3]{512}$ $x = 8$	✓ Laat die kortste sy x wees ✓ x ; $2x$; $3x$ ✓ $(x)(2x)(3x) = 3\,072$ ✓ antwoord (4) **[22]**

VRAAG 2

2.1	$T_n = a + (n-1)d$ $173 = -7 + (n-1)(4)$ $173 = -7 + 4n - 4$ $4n = 184$ $n = 46$ **OF** $T_n = 4n - 11$ $173 = 4n - 11$ $4n = 184$ $n = 46$	✓ $d = 4$ ✓ $T_n = -7 + 4(n-1)$ ✓ antwoord (3) ✓✓ $T_n = 4n - 11$ ✓ antwoord (3)
2.2	$S_n = \frac{n}{2}[a + l]$ $= \frac{46}{2}[-7 + 173]$ $= 23[166]$ $= 3\,818$ **OF** $S_n = \frac{n}{2}[2a + (n-1)d]$ $= \frac{46}{2}[2(-7) + (45)(4)]$ $= 23[-14 + 180]$ $= 3\,818$	✓ subs van $n = 46$ ✓ subs van a en l in die korrekte formule ✓ antwoord (3) ✓ subs van $n = 46$ ✓ subs van a en d in die korrekte formule ✓ antwoord (3)
2.3	$\sum_{n=1}^{46}(4n - 11)$	✓ $n = 1$ ✓ boonste waarde $= 46$ ✓ $4n - 11$ (3) **[9]**

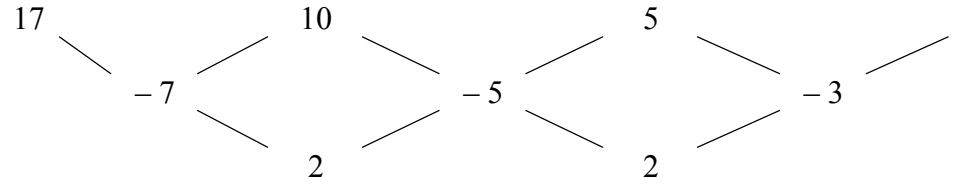
VRAAG 3

3.1.1	$r=-\frac{1}{2}$ $T_4=1\left(-\frac{1}{2}\right)$ $=-\frac{1}{2}$	✓ $r=-\frac{1}{2}$ ✓ antwoord (2)
3.1.2	$T_n=4\left(-\frac{1}{2}\right)^{n-1}$ $\frac{1}{64}=4\left(-\frac{1}{2}\right)^{n-1}$ $\frac{1}{256}=\left(-\frac{1}{2}\right)^{n-1}$ $\left(-\frac{1}{2}\right)^8=\left(-\frac{1}{2}\right)^{n-1}$ $8=n-1$ $n=9$ **OF** $T_4=-\frac{1}{2}$ $T_5=\frac{1}{4}$ $T_6=-\frac{1}{8}$ $T_7=\frac{1}{16}$ $T_8=-\frac{1}{32}$ $T_9=\frac{1}{64}$ $n=9$	**OF** $T_n=-8\left(-\frac{1}{2}\right)^{n}$ $\frac{1}{64}=-8\left(-\frac{1}{2}\right)^{n}$ $\frac{1}{256}=\left(-\frac{1}{2}\right)^{n}$ $\left(-\frac{1}{2}\right)^8=\left(-\frac{1}{2}\right)^{n-1}$ $8=n-1$ $n=9$	✓ $4\left(-\frac{1}{2}\right)^{n-1}$ ✓ substitusie ✓ $\frac{1}{256}=\left(-\frac{1}{2}\right)^{n-1}$ ✓ antwoord (4) ✓ T_5 en T_6 ✓ T_7 ✓ T_8 ✓ antwoord (4)

3.1.3	$S_\infty = \frac{a}{1-r}$ $= \frac{4}{1-\left(-\frac{1}{2}\right)}$ $= \frac{8}{3}$	✓ substitusie in korrekte formule ✓ antwoord (2)

3.2	Vir 'n meetkundige ry: $\frac{x+1}{1} = \frac{x-3}{x+1}$ $x^2 + 2x + 1 = x - 3$ $x^2 + x + 4 = 0$ $x = \frac{-1 \pm \sqrt{1-4(1)(4)}}{2(1)}$ $x = \frac{-1 \pm \sqrt{-15}}{2}$ Oplossing is nie-reëel. Daar is geen x-waarde wat die ry meetkundig kan maak nie. **OF** Vir 'n meetkundige ry: $\frac{x+1}{1} = \frac{x-3}{x+1}$ $x^2 + 2x + 1 = x - 3$ $x^2 + x + 4 = 0$ $b^2 - 4ac = 1 - 4(1)(4)$ $= -15$ Oplossing is nie-reëel. Daar is geen x-waarde wat die ry meetkundig kan maak nie.	**OF** $x^2 + 2x + 1 = x - 3$ $x^2 + x + 4 = 0$ $\left(x + \frac{1}{2}\right)^2 + \frac{15}{4} = 0$ $\left(x + \frac{1}{2}\right)^2 + \frac{15}{4} \geq \frac{15}{4} > 0$	✓ $\frac{T_2}{T_1} = \frac{T_3}{T_2}$ ✓ standaardvorm ✓ subs in kwadratiese formule ✓ nie-reëel/geen x-waarde (4) ✓ $\frac{T_2}{T_1} = \frac{T_3}{T_2}$ ✓ standaardvorm ✓ subs in diskriminant ✓ nie-reëel/geen x-waarde (4) **[12]**

VRAAG 4

4.1	 $r = 1$ $s = 2$ **OF** **LET WEL:** Kandidate mag 4.2 eerste doen. $d(n) = n^2 - 10n + 26$ $r = d(5)$ $= (5)^2 - 10(5) + 26$ $= 1$ $s = d(6)$ $= (6)^2 - 10(6) + 26$ $= 12$ **OF** $d(n) = (n-5)^2 + 1$ $r = d(5)$ $= (5-5)^2 + 1$ $= 1$ $s = d(6)$ $= (6-5)^2 + 1$ $= 2$	✓ voltooiing van patroon. ✓ $r = 1$ ✓ $s = 2$ (3) ✓ ✓ $d(n) = n^2 - 10n + 26$ ✓ $r = 1$ ✓ $s = 2$ (3) ✓ $d(n) = (n-5)^2 + 1$ ✓ $r = 1$ ✓ $s = 2$ (3)
4.2	$2a = 2$ $a = 1$ $3a + b = -7$ $\therefore 3(1) + b = -7$ $b = -10$ $\therefore a + b + c = 17$ $1 - 10 + c = 17$ $c = 26$ $\therefore d(n) = n^2 - 10n + 26$ **OF**	✓ $a = 1$ ✓ metode ✓ $b = -10$ ✓ $c = 26$ (4)

$a+b+c=17$
$4a+2b+c=10$
$3a+b=-7$
$9a+3b=-21$
$9a+3b+c=5$
$-21+c=5$
$c=26$
$a+b=-9$
$4a+2b=-16$
$2a+2b=-18$
$2a=2$
$a=1$
$b=-10$
$d(n)=n^2-10n+26$

OF

$a+b+c=17$
$4a+2b+c=10$
$9a+3b+c=5$
$3a+b=-7$
$5a+b=-5$
$2a=2$
$a=1$
$3(1)+b=-7$
$b=-10$
$(1)-10+c=17$
$c=26$
$d(n)=n^2-10n+26$

✓ metode
✓ $a=1$
✓ $c=26$
✓ $b=-10$ (4)

OF

$2a=2$
$a=1$
$c=26$
$d(n)=n^2+bn+26$
$17=(1)^2+b+26$
$b=-10$
$d(n)=n^2-10n+26$

✓ $a=1$
✓ $c=26$
✓ metode
✓ $b=-10$ (4)

OF

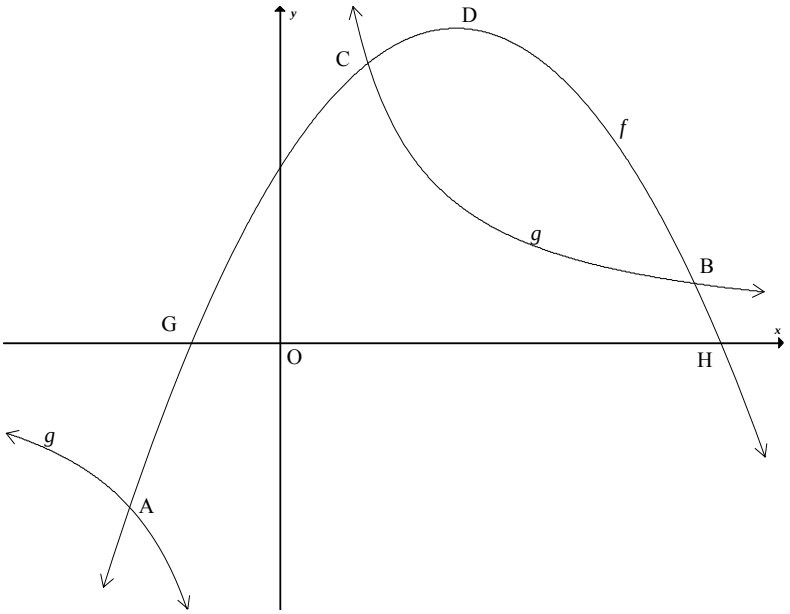
$\text{d(n)}=\frac{n-1}{2}\left[2(\text{eerste verskil})+(n-2)(\text{tweede verskil})\right]+\text{d(1)}$
$d(n)=\frac{n-1}{2}\left[2(-7)+(n-2)(2)\right]+17$
$d(n)=\frac{n-1}{2}\left[-18-2n\right]+17$
$d(n)=(n-1)(-9-n)+17$
$d(n)=n^2-10n+26$

✓ metode
✓ $a=1$
✓ $c=26$
✓ $b=-10$ (4)

OF

	$d(n) = (n-1)d(2) - (n-2)d(1) + \text{tweede verskil} \times \frac{(n-1)(n-2)}{2}$ $d(n) = (n-1)(10) - (n-2)(17) + \frac{2(n-1)(n-2)}{2}$ $d(n) = 10n - 10 - 17n + 34 + (n-1)(n-2)$ $d(n) = n^2 - 10n + 26$ **OF** $d(n) = (n-5)^2 + 1$ $= n^2 - 10n + 26$ $a = 1$ $b = -10$ $c = 26$	✓ metode ✓ $a = 1$ ✓ $c = 26$ ✓ $b = -10$ (4) ✓ metode ✓ $a = 1$ ✓ $c = 26$ ✓ $b = -10$ (4)
4.3	$d(8) = (8)^2 - 10(8) + 26$ $= 10$ m **OF** Deur simmetrie $d(8)$ $= d(5+3)$ $= d(5-3)$ $= d(2)$ $= 10$ **OF** 17, 10, 5, 2, 1, 2, 5, 10 $\therefore d(8) = 10$	✓ subs $n = 8$ ✓ antwoord (2) ✓ metode ✓ antwoord (2) ✓ metode ✓ antwoord (2)
4.4	Aangesien die afstand vanaf P vir $n < 5$ afneem beweeg die atleet na P. Aangesien die afstand vanaf P vir $n > 5$ toeneem, beweeg die atleet weg van P af. **OF** Dit is voldoende om te wys dat d afnemend (dalend) is as $n < 5$ en toenemend (stygend) is as $n > 5$ $d(n) = n^2 - 10n + 26$ $d'(n) = 2n - 10$ $d'(n) = 2(n-5)$ Vir $n < 5$, $2(n-5) < 0$ $d'(n) < 0 \therefore$ afneem Vir $n > 5$, $2(n-5) > 0$ $d'(n) > 0 \therefore$ toeneem	✓✓ afneem Beweeg na ✓✓toeneem Beweeg weg ✓ $d'(n) = 2n - 10$ ✓ $2(n-5) < 0$ ✓ afneem ✓ toeneem (4) **[13]**

VRAAG 5

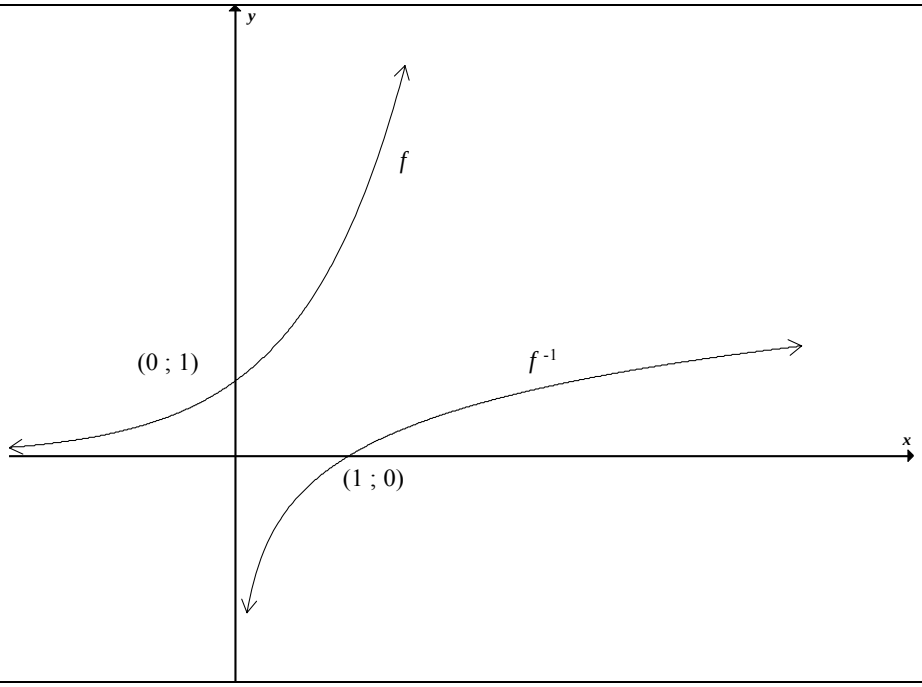


5.1	$x = 0$ $y = 0$	✓ antwoord ✓ antwoord (2)
5.2	$f(x) = -2x^2 + 8x + 10$ $x^2 - 4x - 5 = 0$ $(x-5)(x+1) = 0$ $x = 5$ of $x = -1$ H(5 ; 0)	✓ gelyk aan 0 ✓ faktore ✓ x-waardes ✓ antwoord (4)
5.3	$f(x) = -2x^2 + 8x + 10$ $f(x) = -2(x-2)^2 + 18$ Waardeversameling van f is $y \le 18$ **OF** $y \in (-\infty ; 18]$ **OF** $f(x) = -2x^2 + 8x + 10$ $x = -\frac{8}{2(-2)}$ $x = 2$ $y = -2(2)^2 + 8(2) + 10$ $y = 18$ Waardeversameling van f is $y \le 18$ **OF** $y \in (-\infty ; 18]$ **OF** $x = \frac{5-1}{2}$ $x = 2$ $y = -2(2)^2 + 8(2) + 10$ $y = 18$ Waardeversameling van f is $y \le 18$ **OF** $y \in (-\infty ; 18]$	✓ metode ✓ $(x-2)^2$ ✓ 18 ✓ antwoord (4) ✓ metode ✓ $x = 2$ ✓ $y = 18$ ✓ antwoord (4) ✓metode ✓ $x = 2$ ✓ $y = 18$ ✓ antwoord (4)

	OF $f(x) = -2x^2 + 8x + 10$ $f'(x) = -4x + 8$ $0 = -4x + 8$ $x = 2$ $y = -2(2)^2 + 8(2) + 10$ $y = 18$ Waardeversameling van f is $y \leq 18$ **OF** $y \in (-\infty ; 18]$	✓ metode ✓ $x = 2$ ✓ $y = 18$ ✓ antwoord (4)
5.4	$f(1) = -2(1)^2 + 8(1) + 10$ $f(1) = 16$ $g(1) = \frac{16}{1}$ $g(1) = 16$ C(1 ; 16) is 'n punt op beide die grafieke f en g **OF** $-2x^2 + 8x + 10 = \frac{16}{x}$ $-2x^3 + 8x^2 + 10x - 16 = 0$ $x^3 - 4x^2 - 5x + 8 = 0$ $(x-1)(x^2 - 3x - 8) = 0$ $x = 1$ *or* $x^2 - 3x - 8 = 0$ C(1 ; 16)	✓ substitusie $f(1)$ ✓ substitusie $g(1)$ (2) ✓ stel vergelykings gelyk ✓ antwoord (2)
5.5	$p(x) = f(3x)$ $3x = 2$ $x = \frac{2}{3}$ Draaipunt $(\frac{2}{3} ; 18)$ **NOTA:** Slegs Antwoord: Volpunte **OF** $p(x) = -2(3x)^2 + 8(3x) + 10$ $= -18x^2 + 24x + 10$ $x = -\frac{24}{2(-18)}$ $x = \frac{2}{3}$ Draaipunt $(\frac{2}{3} ; 18)$ **OF**	✓ $3x = 2$ ✓ $x = \frac{2}{3}$ ✓ $y = 18$ (3) ✓ $x = -\frac{24}{2(-18)}$ ✓ $x = \frac{2}{3}$ ✓ $y = 18$ (3)

	$p(x) = -2(3x)^2 + 8(3x) + 10$ $= -18x^2 + 24x + 10$ $p'(x) = -36x + 24$ $0 = -36x + 24$ $x = \frac{2}{3}$ Draaipunt $(\frac{2}{3}\ ;\ 18)$ **OF** $p(x) = -2(3x)^2 + 8(3x) + 10$ $= -18x^2 + 24x + 10$ $= -18\left(x - \frac{2}{3}\right)^2 + 18$ Draaipunt $(\frac{2}{3}\ ;\ 18)$	✓ $0 = -36x + 24$ ✓ $x = \frac{2}{3}$ ✓ $y = 18$ (3) ✓ $p(x) = -18\left(x - \frac{2}{3}\right)^2 + 18$ ✓ $x = \frac{2}{3}$ ✓ $y = 18$ (3) **[15]**

VRAAG 6

6.1	$f(x) = 3^x$ $f^{-1}(x) = \log_3 x$	✓ antwoord (1)
6.2		$f^{-1}(x) = \log_3 x$ (Log Grafiek) ✓vorm ✓x-afsnit $f(x) = 3^x$ (Exponensiële Grafiek) ✓vorm ✓y-afsnit (4)
6.3	$x > 0$ **OF**	✓✓ antwoord (2)

	$x \in (0\,;\infty)$	
6.4	$0 < x \leq 1$	✓ kritieke waardes ✓ notasie (2)
6.5	$y > -4$ **OF** $y \in (-4\,;\infty)$	✓✓ antwoord (2)
6.6	$g(x) = -3^{x-2}$ **OF** $g(x) = -f(x-2)$ **OF** $g(x) = -\frac{1}{9}\left(3^{x}\right)$ **OF** $g(x) = -\frac{1}{9}f(x)$	✓ – (teken) ✓ $x-2$ (2) ✓ – (teken) ✓ $\frac{1}{9}$ (2) **[13]**

VRAAG 7

7.1	$\frac{88}{100} \times 850\,000$ $= \text{R}748\,000$ **OF** $\frac{12}{100} \times 850\,000$ $= \text{R}\,102\,000$ Leningsbedrag $= \text{R}850\,000 - \text{R}102\,000$ $= \text{R}748\,000$	✓ $\frac{88}{100} \times 850\,000$ ✓ antwoord (2) ✓ $\frac{12}{100} \times 850\,000$ ✓ antwoord (2)
7.2	$1 + i_e = \left(1 + \frac{0{,}09}{12}\right)^{12}$ $i_e = 0{,}09380689$ $r = 9{,}38\%\ \ p.a$ $\neq 9{,}6\%$ Nie korrek **OF** $1 + 0{,}096 = \left(1 + \frac{i}{12}\right)^{12}$ $\sqrt[12]{1{,}096} = 1 + \frac{i}{12}$ $1{,}007668183 = 1 + \frac{i}{12}$ $i = 0{,}092018201$ $r = 9{,}2\%\ \ p.a$ $\neq 9\%$ Nie korrek	✓ $\frac{0{,}09}{12}$ ✓ substitusie ✓ antwoord ✓ besluit (4) ✓ $\frac{i}{12}$ ✓ substitusie ✓ antwoord ✓ besluit (4)
7.3	$P_v = \frac{x[1-(1+i)^{-n}]}{i}$ $748\,000 = \frac{x\left[1-\left(1+\frac{0{,}09}{12}\right)^{-240}\right]}{\frac{0{,}09}{12}}$ $x = \text{R}6\,729{,}95$	✓ subs in korrekte formule ✓ $i = \frac{0{,}09}{12}$ ✓ n = – 240 ✓ antwoord (4)

7.4

$$P_v = \frac{x[1-(1+i)^{-n}]}{i}$$

$$748\,000 = \frac{7\,000\left[1-\left(1+\frac{0,09}{12}\right)^{-n}\right]}{\frac{0,09}{12}}$$

✓ subs in korrekte formule

$$\frac{561}{700} = 1-\left(1+\frac{0,09}{12}\right)^{-n}$$

$$\left(1+\frac{0,09}{12}\right)^{-n} = \frac{139}{700}$$

✓ vereenvoudiging

$$-n\log\left(1+\frac{0,09}{12}\right) = \log\frac{139}{700}$$

✓ toepassing van logs

$$n = 216,35 \text{ maande}$$
$$= 18,03 \text{ jare}$$

✓ antwoord (4)

OF

$$P_v = \frac{x[1-(1+i)^{n}]}{i}$$

$$748\,000 = \frac{7\,000\left[1-\left(1+\frac{0,09}{12}\right)^{12n}\right]}{\frac{0,09}{12}}$$

✓ subs in korrekte formule

$$\frac{561}{700} = 1-\left(1+\frac{0,09}{12}\right)^{12n}$$

$$\left(1+\frac{0,09}{12}\right)^{12n} = \frac{139}{700}$$

✓ vereenvoudiging

$$12n\log\left(1+\frac{0,09}{12}\right) = \log\frac{139}{700}$$

✓ toepassing van logs

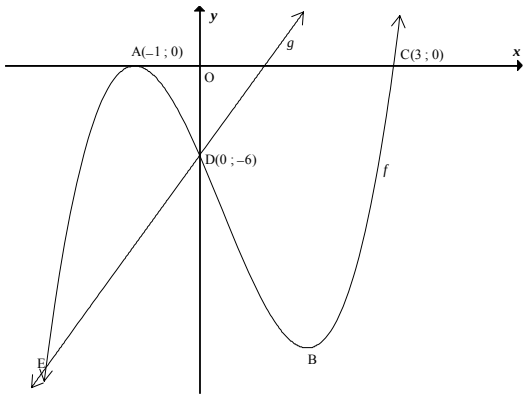
$$n = 18,03 \text{ jaar}$$

✓ antwoord (4)
[14]

VRAAG 8

8.1	$f(x) = 9 - x^2$ $f(x+h) = 9 - (x+h)^2$ $= 9 - x^2 - 2xh - h^2$ $f(x+h) - f(x) = -2xh - h^2$ $f'(x) = \lim_{h\to 0} \frac{-2xh - h^2}{h}$ $= \lim_{h\to 0} \frac{h(-2x-h)}{h}$ $= \lim_{h\to 0}(-2x-h)$ $= -2x$	✓ substitusie ✓ vereenvoudiging ✓ formule ✓ gemeenskaplike faktor ✓ antwoord (5)
	OF	
	$f'(x) = \lim_{h\to 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h\to 0} \frac{9 - (x+h)^2 - (9 - x^2)}{h}$ $= \lim_{h\to 0} \frac{9 - (x^2 + 2xh + h^2) - 9 + x^2}{h}$ $= \lim_{h\to 0} \frac{-2xh - h^2}{h}$ $= \lim_{h\to 0} \frac{h(-2x-h)}{h}$ $= \lim_{h\to 0}(-2x-h)$ $= -2x$	✓ formule ✓ substitusie ✓ vereenvoudiging ✓ gemeenskaplike faktor ✓ antwoord (5)
8.2.1	$D_x[1 + 6\sqrt{x}]$ $= D_x\left[1 + 6x^{\frac{1}{2}}\right]$ $= 3x^{-\frac{1}{2}}$	✓ $6x^{\frac{1}{2}}$ ✓ antwoord (2)
8.2.2	$y = \frac{8 - 3x^6}{8x^5}$ $= \frac{1}{x^5} - \frac{3}{8}x$ $= x^{-5} - \frac{3}{8}x$ $\frac{dy}{dx} = -5x^{-6} - \frac{3}{8}$	✓ x^{-5} ✓ $\frac{3}{8}x$ ✓ $-5x^{-6}$ ✓ $-\frac{3}{8}$ (4) **[11]**

VRAAG 9

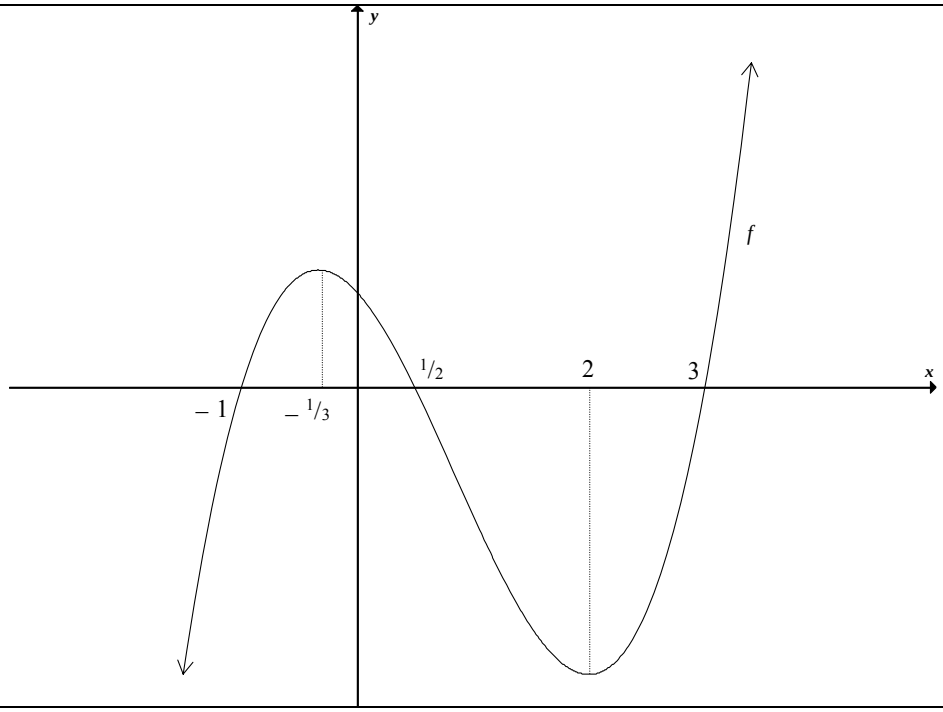


9.1	$f(x) = a(x+1)^2(x-3)$ $-6 = a(0+1)^2(0-3)$ $-6 = -3a$ $a = 2$ $f(x) = 2(x^2+2x+1)(x-3)$ $= 2x^3 - 2x^2 - 10x - 6$	✓✓ substitusie van x-waardes ✓ subs $(0\ ;-6)$ ✓ $a = 2$ ✓ vereenvoudiging (5)
9.2	$f'(x) = 6x^2 - 4x - 10$ $6x^2 - 4x - 10 = 0$ $3x^2 - 2x - 5 = 0$ $(3x-5)(x+1) = 0$ $x = \frac{5}{3}$ of $x = -1$ $B\left(\frac{5}{3}\ ;-\frac{512}{27}\right)$ **OF** $B(1{,}67\ ;-18{,}96)$	✓ $f'(x) = 6x^2 - 4x - 6$ ✓ $f'(x) = 0$ ✓ faktore ✓ x-waarde ✓ y-waarde (5)
9.3	$h(x) = 2x^3 - 2x^2 - 10x - 6 - (6x-6)$ $= 2x^3 - 2x^2 - 16x$ $h'(x) = 6x^2 - 4x - 16$ $0 = 3x^2 - 2x - 8$ $0 = (3x+4)(x-2)$ $x = -\frac{4}{3}$ of $x = 2$ $\therefore x = -\frac{4}{3}$	✓ $h(x) = 2x^3 - 2x^2 - 16x$ ✓ $h'(x) = 6x^2 - 4x - 16$ ✓ $h'(x) = 0$ ✓ faktore ✓ korrekte x-waarde (5) **[15]**

VRAAG 10

10.1	$y = 5(1) - 8$ $= -3$ Raakpunt is $(1 ; -3)$	✓ subs 1 (1)
10.2	$-3 = 2(1)^3 + p(1)^2 + q(1) - 7$ $2 = p + q$ $g'(x) = 6x^2 + 2px + q$ $g'(1) = 5$ $5 = 6(1)^2 + 2p(1) + q$ $-1 = 2p + q$ $p = -3$ $q = 5$	✓ subs $(1 ; -3)$ ✓ $g'(x) = 6x^2 + 2px + q$ ✓ subs $x = 1$ en $y = 5$ ✓ vereenvoudiging ✓ p-waarde ✓ q-waarde (6) **[7]**

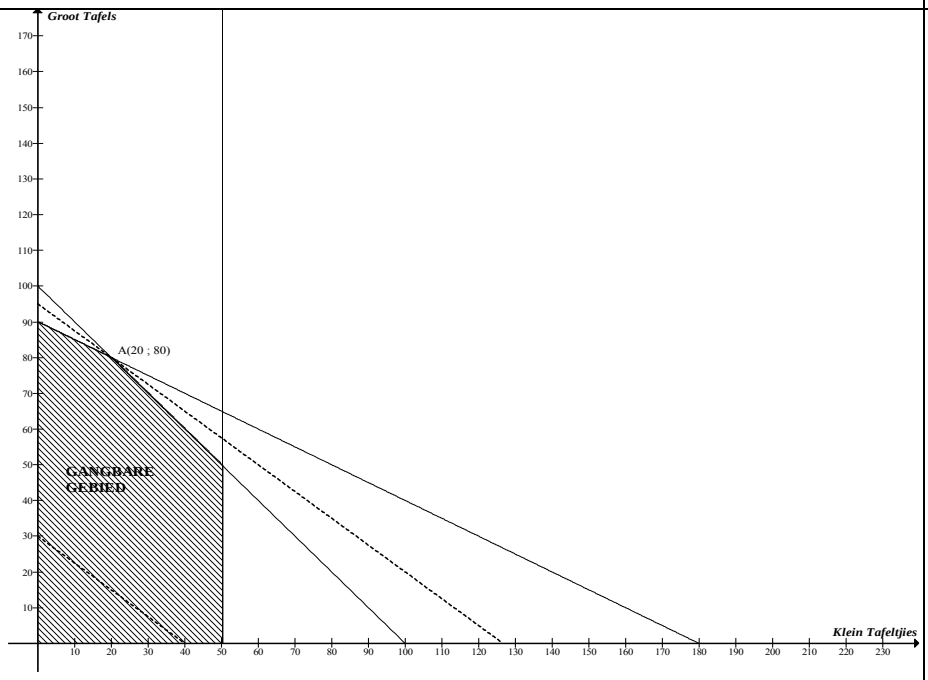
VRAAG 11



✓ x-afsnitte
✓ draaipunt
✓✓ vorm

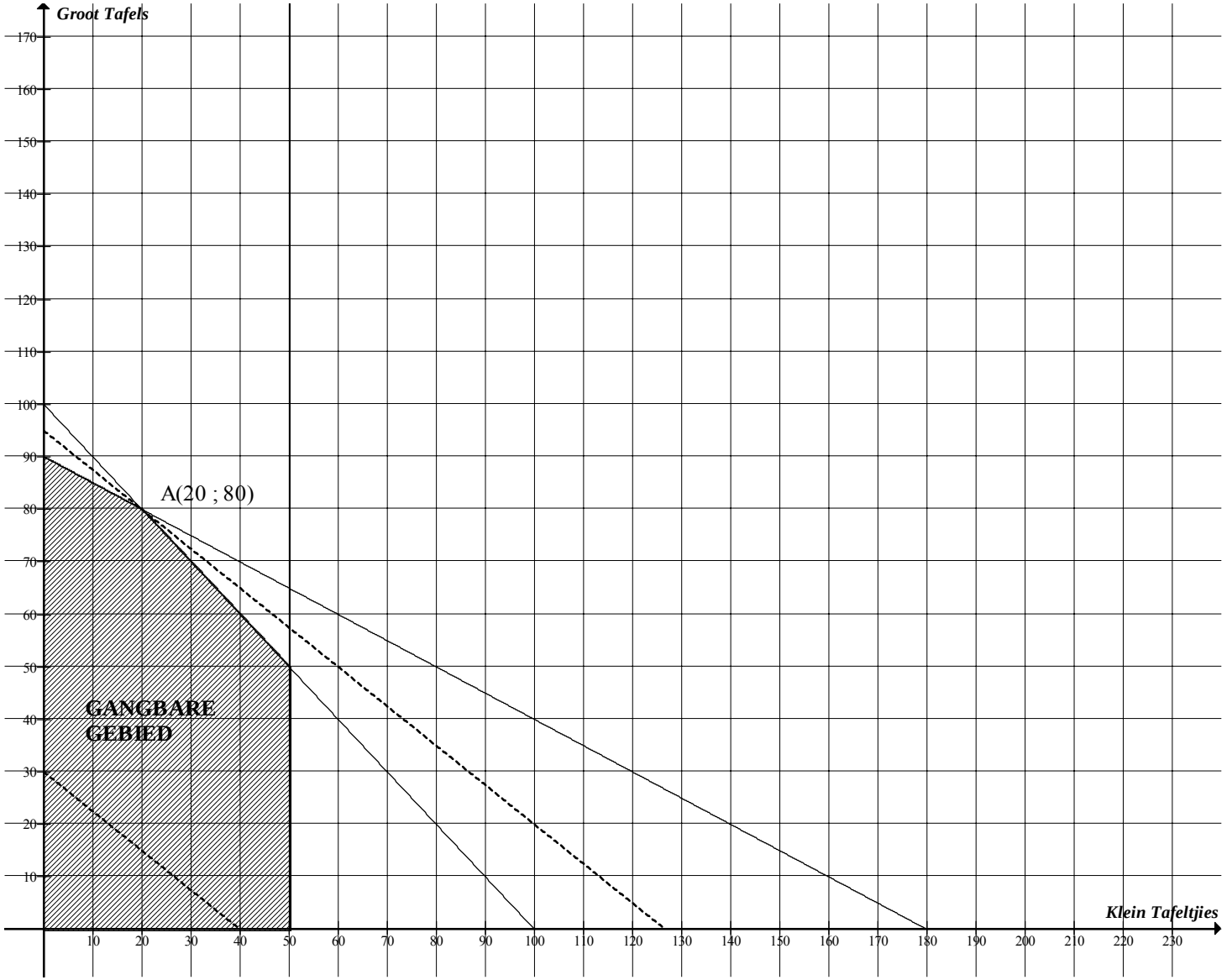
[4]

VRAAG 12

12.1	$x, y \in N_0$ $x + y \le 100$ $x \le 50$ $x + 2y \le 180$ **OF** $y \le -x + 100$ $x \le 50$ $y \le -\frac{1}{2}x + 90$	✓✓ $x + y \le 100$ ✓✓ $x + 2y \le 180$ ✓ $x \le 50$ (5)
12.2		✓✓✓ elke beperking ✓ gangbare gebied (4)
12.3	90 tafels	✓ antwoord (1)
12.4	$P = 300x + 400y$	✓ antwoord (1)
12.5	Maksimum by A (20 ; 80) 20 klein tafeljies en 80 groot tafels	✓✓ antwoord (2)
12.6	$P = qx + 400y$ $m = -\frac{q}{400}$ $-1 \le -\frac{q}{400} \le -\frac{1}{2}$ $200 \le q \le 400$	✓ $m = -\frac{q}{400}$ ✓ $200 \le q \le 400$ (2) **[15]**

TOTAAL: 150

QUESTION 12.2



Kopiereg voorbehou