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GRADE 12/GRAAD 12

SEPTEMBER 2020

**MATHEMATICS P1/WISKUNDE V1
MARKING GUIDELINE/NASIENRIGLYN**

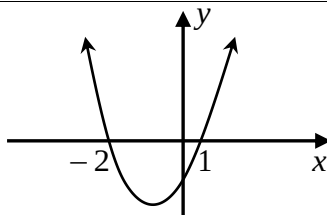
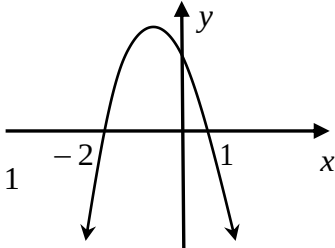
MARKS/PUNTE: 150

This marking guideline consists of 16 pages./
Hierdie nasienriglyn bestaan uit 16 bladsye.

NOTE/LET WEL:

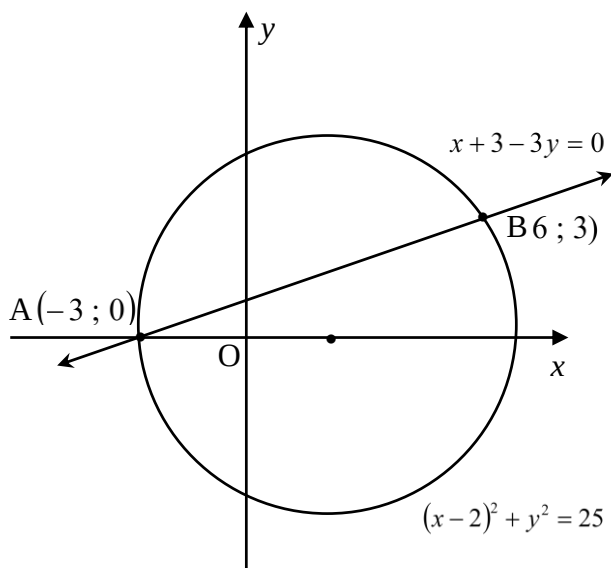
- If a candidate answers a question TWICE, mark the FIRST attempt ONLY.
Indien 'n kandidaat 'n vraag TWEE keer beantwoord, merk SLEGS die EERSTE poging.
- Consistent accuracy applies in ALL aspects of the marking guideline.
Volgehoue akkuraatheid geld deurgaans in ALLE aspekte van die nasienriglyn.
- 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 vir substitusie in die korrekte formule toegeken.

QUESTION 1/VRAAG 1

1.1.1	$2x^2 + x - 3 = 0$ $(2x+3)(x-1) = 0$ $\therefore x = -\frac{3}{2} \quad \text{or / of} \quad x = 1$	$\checkmark$ factorisation / <i>faktorisering</i> $\checkmark x = -\frac{3}{2} \quad \checkmark x = 1$ (3)
1.1.2	$x(7x+2) = 1$ $7x^2 + 2x - 1 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-2 \pm \sqrt{2^2 - 4(7)(-1)}}{2(7)}$ $= \frac{-2 \pm \sqrt{32}}{14}$ $= 0,26 \quad \text{or / of} \quad -0,55$	$\checkmark$ standard form / <i>standaardvorm</i> $\checkmark$ substitution / <i>vervanging</i> $\checkmark 0,26 \quad \checkmark -0,55$ (4)
1.1.3	$-x^2 - x + 2 \leq 0$ $x^2 + x - 2 \geq 0$ $(x+2)(x-1) \geq 0$ $\therefore x \leq -2 \quad \text{or / of} \quad x \geq 1$ OR/OF $-x^2 - x + 2 \leq 0$ $(1-x)(x+2) \leq 0$ $\therefore x \leq -2 \quad \text{or / of} \quad x \geq 1$	 OR/OF  $\checkmark x^2 + x - 2 \geq 0$ $\checkmark x^2 + x - 2 \geq 0$ $\checkmark x \leq -2 \quad \checkmark x \geq 1$ $\checkmark 1 - x$ $\checkmark$ factorisation / <i>faktorisering</i> $\checkmark x \leq -2 \quad \checkmark x \geq 1$ (4)

1.1.4	$2^x + 2^{2-x} = \frac{17}{2}$ $2 \cdot 2^x + 2 \cdot 2^{2-x} = 17$ $2 \cdot 2^x + \frac{2^3}{2^x} = 17$ $2 \cdot 2^{2x} - 17 \cdot 2^x + 8 = 0$ Let / Laat $k = 2^x$, $\therefore 2k^2 - 17k + 8 = 0$ $(2k - 1)(k - 8) = 0$ $k = \frac{1}{2} \quad \text{or / of} \quad k = 8$ $\therefore 2^x = 2^{-1} \quad \text{or / of} \quad 2^x = 2^3$ $x = -1 \quad \text{or / of} \quad x = 3$ OR/OF $2^x + 2^{2-x} = \frac{17}{2}$ $2 \cdot 2^x + 2 \cdot 2^{2-x} = 17$ $2 \cdot 2^x + \frac{2^3}{2^x} = 17$ $2 \cdot 2^{2x} - 17 \cdot 2^x + 8 = 0$ $(2 \cdot 2^x - 1)(2^x - 8) = 0$ $\therefore 2^x = 2^{-1} \quad \text{or / of} \quad 2^x = 2^3$ $x = -1 \quad \text{or / of} \quad x = 3$	✓ standard form / <i>standaardvorm</i> ✓ substitution / <i>vervanging</i> $k = 2^x$ ✓ factorisation / <i>faktorisering</i> ✓ $2^x = 2^{-1}$ and/en $2^x = 2^3$ ✓ both answers / <i>beide antwoorde</i> OR/OF ✓ standard form / <i>standaardvorm</i> ✓ factorisation / <i>faktorisering</i> ✓ $2^x = 2^{-1}$ ✓ $2^x = 2^3$ ✓ both answers / <i>beide antwoorde</i> (5)
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1.2



$$(x-2)^2 + y^2 = 25 \quad (1)$$

$$x + 3 - 3y = 0 \quad (2)$$

$$x = 3y - 3 \quad (3)$$

$$(3y - 3 - 2)^2 + y^2 = 25$$

$$(3y - 5)^2 + y^2 = 25$$

$$9y^2 - 30y + 25 + y^2 = 25$$

$$10y^2 - 30y = 0$$

$$10y(y - 3) = 0$$

$$\therefore y = 0 \text{ or / of } y = 3$$

$$x = -3 \text{ or / of } x = 6$$

$$\therefore A(-3; 0) \text{ and/en } B(6; 3)$$

OR/OF

$$\checkmark x = 3y - 3$$

✓ substitution / *vervanging*

✓ standard form / *standaardvorm*

✓ factorisation / *faktorisering*

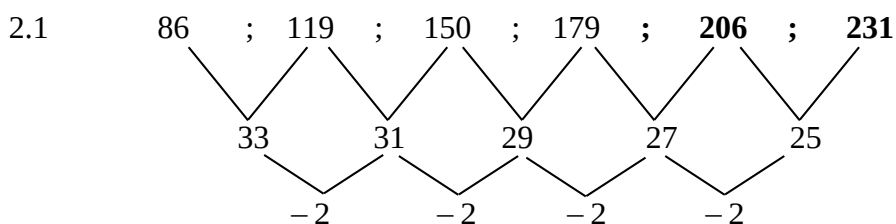
✓ *x and y values / x en y waardes*

✓ both sets of coordinates
beide stelle van koördinate

OR/OF

	$(x-2)^2 + y^2 = 25 \quad (1)$ $x+3-3y=0 \quad (2)$ $y=\frac{1}{3}(x+3) \quad (3)$ $(x-2)^2 + \left(\frac{x}{3}+1\right)^2 = 25$ $x^2 - 4x + 4 + \frac{x^2}{9} + \frac{2x}{3} + 1 - 25 = 0$ $9x^2 - 36x + 36 + x^2 + 6x - 216 = 0$ $10x^2 - 30x - 180 = 0$ $x^2 - 3x - 18 = 0$ $(x+3)(x-6) = 0$ $\therefore x = -3 \quad \text{or / of} \quad x = 6$ $\therefore y = 0 \quad \text{or / of} \quad y = 3$ $\therefore A(-3 ; 0) \quad B(6 ; 3)$	$\checkmark y = \frac{1}{3}(x+3)$ $\checkmark$ substitution / <i>vervanging</i> $\checkmark$ standard form / <i>standaardvorm</i> $\checkmark$ factorisation / <i>faktorisering</i> $\checkmark$ x and y values / <i>x en y waardes</i> $\checkmark$ both sets of coordinates / <i>beide stelle koördinate</i> (6)
1.3	$(x+m)(x+n) = p^2$ $x^2 + nx + mx + mn - p^2 = 0$ $x^2 + (m+n)x + (mn - p^2) = 0$ For real roots / <i>Vir reële wortels:</i> $b^2 - 4ac \geq 0$ $\therefore (m+n)^2 - 4(1)(mn - p^2) \geq 0$ $m^2 + 2mn + n^2 - 4mn + 4p^2 \geq 0$ $m^2 - 2mn + n^2 + 4p^2 \geq 0$ $(m-n)^2 + (2p)^2 \geq 0$ Now/Maar: $(m-n)^2 \geq 0$ and/en $(2p)^2 \geq 0$ $\therefore \Delta \geq 0$	$\checkmark x^2 + (m+n)x + (mn - p^2) = 0$ $\checkmark (m+n)^2 - 4(1)(mn - p^2) \geq 0$ $\checkmark (m-n)^2 + (2p)^2 \geq 0$ $\checkmark$ explanation / <i>verduideliking</i> (4)
		[26]

QUESTION 2/VRAAG 2



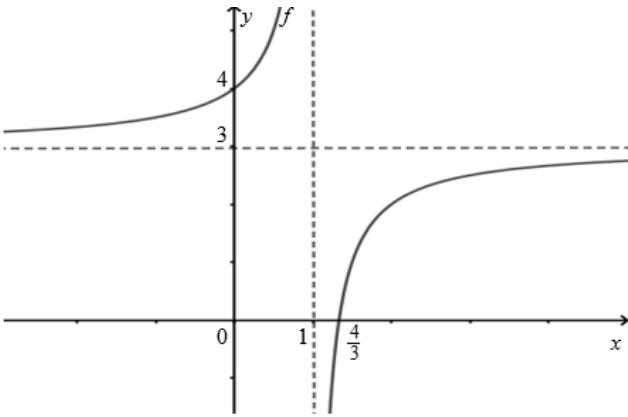
2.1.1	206 ; 231	✓ 206 ✓ 231	(2)	
2.1.2	$2a = -2$ $\therefore a = -1$ $3a + b = 33$ $-3 + b = 33$ $\therefore b = 36$ $a + b + c = 86$ $-1 + 36 + c = 86$ $\therefore c = 51$ $T_n = -n^2 + 36n + 51$	✓ $a = -1$ ✓ $b = 36$ ✓ $c = 51$ ✓ $T_n = -n^2 + 36n + 51$	(4)	
2.1.3	$326 = -n^2 + 36n + 51$ $n^2 - 36n + 275 = 0$ $(n - 11)(n - 25) = 0$ $\therefore n = 11 \quad \text{or / of} \quad n = 25$	✓ substitution / <i>vervanging</i> ✓ method / <i>metode</i> ✓ answers / <i>antwoorde</i>	(3)	
2.1.4	86 + k ; 119 + k 33 -2 150 + k 31 -2 179 + k 29	$2a = -2$ $\therefore a = -1$ $3a + b = 33$ $-3 + b = 33$ $\therefore b = 36$ $a + b + c = 86 + k$ $-1 + 36 + c = 86 + k$ $\therefore c = 51 + k$ $\therefore T_n + k = -n^2 + 36n + (51 + k)$	✓ $a = -1$ and/en $b = 36$ ✓ $c = 51 + k$	(2)

2.2.1	$2y - 1 ; 4y - 1 ; 6y - 1$ $d = 4y - 1 - (2y - 1)$ $= 2y$ $T_n = 2yn - 1$ $T_{30} = 2y(30) - 1$ $= 60y - 1$ OR/OF $T_n = a + (n - 1)d$ $T_{30} = (2y - 1) + (30 - 1)(2y)$ $= 2y - 1 + 58y$ $= 60y - 1$	$\checkmark d = 2y$ $\checkmark 2yn - 1$ $\checkmark 60y - 1$ OR/OF $\checkmark d = 2y$ $\checkmark$ substitution / <i>vervanging</i> $\checkmark$ answer / <i>antwoord</i> (3)
2.2.2	$S_n = \frac{n}{2} [2a + (n - 1)d]$ $S_{30} = \frac{30}{2} [2(2y - 1) + 29(2y)]$ $= 15(4y - 2 + 58y)$ $= 15(62y - 2)$ $\therefore -2820 = 15(62y - 2)$ $-188 = 62y - 2$ $-186 = 62y$ $\therefore y = -3$ OR/OF $S_n = \frac{n}{2} [a + l]$ $S_{30} = \frac{30}{2} [2y - 1 + 60y - 1]$ $-2820 = 15[62y - 2]$ $-188 = 62y - 2$ $-186 = 62y$ $\therefore y = -3$	$\checkmark d = 2y$ $\checkmark$ substitution into correct formula <i>vervanging in die korrekte formule</i> $\checkmark$ equating to $-2820 /$ <i>stel gelyk aan -2820</i> $\checkmark$ answer / <i>antwoord</i> OR/OF $\checkmark d = 2y$ $\checkmark$ substituting a and $l /$ <i>vervanging van a en l</i> $\checkmark$ equating to -2820 <i>stel gelyk aan -2820</i> $\checkmark$ answer / <i>antwoord</i> (4)
		[18]

QUESTION 3/VRAAG 3

3.1	$1 + 4 + 4^2 + 4^3 + \dots + 4^{n-1}$ $\therefore T_n = 4^{n-1}$ $\therefore \text{Sum/Som: } \sum_{n=1}^7 4^{n-1}$ For original sequence:/Vir oorspronklike ry: $\text{Sum/Som: } \sum_{n=1}^{5000} n$ $S_n : \sum_{n=1}^{5000} n - \sum_{n=1}^7 4^{n-1}$	$\checkmark T_n = 4^{n-1}$ $\checkmark \sum_{n=1}^7 4^{n-1}$ $\checkmark \sum_{n=1}^{5000} n$ $\checkmark \text{answer / antwoord}$ (4)
3.2	$S_\infty = \frac{1}{a-r}$ $\therefore 1 + x + x^2 + x^3 + \dots = \frac{1}{1-x} \text{ and/en}$ $1 - x + x^2 - x^3 + \dots = \frac{1}{1+x}$ $\text{Sum/Som: } \frac{1}{1-x} + \frac{1}{1+x}$ $= \frac{1+x+1-x}{(1-x)(1+x)}$ $= \frac{2}{1-x^2}$ $\therefore \frac{2}{1-x^2} = 8$ $8 - 8x^2 = 2$ $-8x^2 = -6$ $x^2 = \frac{3}{4}$ $x = \pm \frac{\sqrt{3}}{2}$	$\checkmark \frac{1}{1-x}$ $\checkmark \frac{1}{1+x}$ $\checkmark \frac{2}{1-x^2}$ $\checkmark \text{equating sum to 8}$ $\text{stel som gelyk aan 8}$ $\checkmark x^2 = \frac{3}{4}$ $\checkmark \text{answer / antwoord}$ (6)
		[10]

QUESTION 4/VRAAG 4

4.1	$f(x) = \frac{a}{x-1} + 3,$ $x=1; \quad y=3$	$\checkmark x=1 \quad \checkmark y=3$	(2)
4.2	$y = \frac{a}{0-1} + 3$ $= 3 - a$ $0 = \frac{a}{x-1} + 3$ $-3 = \frac{a}{x-1}$ $-3x + 3 = a$ $x = 1 - \frac{a}{3} \text{ or / of } \frac{3-a}{3}$	$\checkmark 3 - a$ $\checkmark y = 0$ $\checkmark x = 1 - \frac{a}{3} \text{ or / of } \frac{3-a}{3}$	(3)
4.3		$\checkmark$ asymptotes / <i>asimptote</i> $\checkmark$ y-intercepts / <i>y-afsnitte</i> $\checkmark$ x-intercepts / <i>x-afsnitte</i> $\checkmark$ shape / <i>vorm</i>	(4)
4.4	$f(x) = \frac{a}{x+2} + 1 \text{ or / of } f(x) = \frac{-1}{x+2} + 1$	$\checkmark x+2 \quad \checkmark +1$	(2)
			[11]

QUESTION 5/VRAAG 5

5.1	$(0; -7)$	✓ $y = -7$ (1)
5.2	$q = -8$	✓ $q = -8$ (1)
5.3	$g(x) = b^x - 8$ $-5 = b^1 - 8$ $\therefore b = 3$ At turning point of f : / By die draaipunt van f : $x = -\frac{b}{2a} = -\frac{3}{4}$ $\Rightarrow -\frac{3}{2a} = -\frac{3}{4}$ $\therefore -6a = -12$ $a = 2$ $\therefore -5 = 2(1)^2 + 3(1) + c$ $c = -10$	✓ substituting $(1; -5)$ / vervanging van $(1; -5)$ ✓ $x = -\frac{b}{2a}$ ✓ $-\frac{b}{2a} = -\frac{3}{4}$ ✓ $b = 3$ ✓ simplifying / vereenvoudiging ✓ $f(1) = -5$ (6)
5.4	$y > -8; y \in \mathbb{R}$	✓✓ $y > -8$ (accuracy) / (akkuraatheid) (2)
5.5	$y + 9x = -28$ $y = -9x - 28$ $y = 2x^2 + 3x - 10$ $\therefore 2x^2 + 3x - 10 = -9x - 28$ $2x^2 + 12x + 18 = 0$ $x^2 + 6x + 9 = 0$ $(x + 3)(x + 3) = 0$ $\therefore x = -3$ $y = 2(-3)^2 + 3(-3) - 10$ $= -1$ $\therefore T(-3; -1)$ OR/OF $y = -9x - 28$ $\therefore m = -9$ $f(x) = 2x^2 + 3x - 10$ $f'(x) = 4x + 3 = -9$ $\therefore 4x = -12$ $x = -3$ $y = -9(-3) - 28$ $= -1$ $\therefore T(-3; -1)$	✓ $2x^2 + 3x - 10 = -9x - 28$ ✓ standard form / standaardvorm ✓ factorisation / faktorisering ✓ $x = -3$ ✓ $y = -1$ OR/OF ✓ $m = -9$ ✓ $f'(x) = 4x + 3$ ✓ equating gradients / stel gradiënte gelyk ✓ $x = -3$ ✓ $y = -1$ (5)

5.6	$y = \log_3 x$	✓ ✓ $y = \log_3 x$ (2)
5.7	$p(x) = f(x) + 1$ $= 2x^2 + 3x - 10 + 1$ $= 2x^2 + 3x - 9$ $= (2x - 3)(x + 3)$ $\therefore$ when/wanneer: $y = 0$, $x = \frac{3}{2}$ or / of -3 $\therefore x < -3$ or / of $0 < x < \frac{3}{2}$	✓ $p(x) = 2x^2 + 3x - 9$ ✓ x-intercepts / x-afsnitte ✓ $x < -3$ ✓ $0 < x < \frac{3}{2}$ (accuracy/akkuraatheid) (4)
		[21]

QUESTION 6/VRAAG 6

6.1	$A = P(1-i)^n$ $\frac{1}{3}x = x(1-i)^4$ $\frac{1}{3} = (1-i)^4$ $3^{\frac{1}{4}} - 1 = -i$ $-0,24 = -i$ $\therefore i = 0,24$ $\therefore r = 24\%$	$\checkmark \frac{1}{3}x = x(1-i)^4$ $\checkmark i = 0,24$ $\checkmark \text{answer / antwoord}$ (3)
6.2.1	$F = \frac{x[(1+i)^n - 1]}{i}$ $R596\,458,10 = \frac{x \left[\left(1 + \frac{0,095}{12} \right)^{72} - 1 \right]}{\frac{0,095}{12}}$ $x = \frac{R596\,458,10 \times \frac{0,095}{12}}{\left[\left(1 + \frac{0,095}{12} \right)^{72} - 1 \right]}$ $= R6178,13$	$\checkmark i = \frac{0,095}{12}$ $\checkmark n = 72$ $\checkmark F = R596\,458,10$ $\checkmark \text{substitution into correct formula /}$ $\text{vervanging in die korrekte formule}$ $\checkmark \text{answer / antwoord}$ (5)
6.2.2	$P = \frac{x[1 - (1+i)^{-n}]}{i}$ $= \frac{R6178,13 \left[1 - \left(1 + \frac{0,095}{12} \right)^{-72} \right]}{\frac{0,095}{12}}$ $= R338\,070,29$ $A = P(1+i)^n$ $R338\,070,29 = P \left(1 + \frac{0,095}{12} \right)^5$ $\therefore P = \frac{R338\,070,29}{\left(1 + \frac{0,095}{12} \right)^5}$ $= R325\,000$	$\checkmark n = -72$ $\checkmark \text{substitution into correct formula /}$ $\text{vervanging in die korrekte formule}$ $\checkmark A = R338\,070,29$ $\checkmark n = 5$ $\checkmark \text{substitution into correct formula /}$ $\text{vervanging in die korrekte formule}$ $\checkmark \text{answer / antwoord}$ (6)
		[14]

QUESTION 7/VRAAG 7

7.1	$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{-2(x+h)^2 - (-2x^2)}{h}$ $= \lim_{h \rightarrow 0} \frac{-2(x^2 + 2xh + h^2) + 2x^2}{h}$ $= \lim_{h \rightarrow 0} \frac{-2x^2 - 4xh - 2h^2 + 2x^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(-4x - 2h)}{h}$ $= \lim_{h \rightarrow 0} (-4x - 2h)$ $= -4x$ OR/OF $f(x) = -2x^2$ $f(x+h) - f(x) = -2(x+h)^2 - (-2x^2)$ $= -2x^2 - 2xh - 2h^2 + 2x^2$ $= -4xh - 2h^2$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{-4xh - 2h^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(-4x - 2h)}{h}$ $= \lim_{h \rightarrow 0} (-4x - 2h)$ $= -4x$	✓ substitution / vervanging ✓ expansion / uitbreiding ✓ $-2x^2 - 4xh - 2h^2 + 2x^2$ ✓ factorisation / faktorisering ✓ $-4x$ OR/OF ✓ $-2x^2 - 2xh - 2h^2 + 2x^2$ ✓ $-4xh - 2h^2$ ✓ substitution / vervanging ✓ factorisation / faktorisering ✓ $-4x$ (5)
7.2	$y = 7x^4 - \frac{2}{\sqrt{x^3}}$ $= 7x^4 - 2x^{-\frac{3}{2}}$ $\therefore \frac{dy}{dx} = 28x^3 + 3x^{-\frac{5}{2}}$	✓ $2x^{-\frac{3}{2}}$ ✓ $28x^3$ ✓ $+ 3x^{-\frac{5}{2}}$ (3)
7.3	$D_t \left[\frac{1}{2}gt^2 - \frac{5}{t} + 3g \right]$ $= D_t \left[\frac{1}{2}gt^2 - 5t^{-1} + 3g \right]$ $= gt + 5t^{-2}$	✓ $5t^{-1}$ ✓ gt ✓ $+ 5t^{-2}$ ✓ $D_t(3g) = 0$ (4)
		[12]

QUESTION 8/VRAAG 8

8.1	(0 ; 9)	✓ (0 ; 9) (1)
8.2	$f(x) = 2x^3 + x^2 - 12x + 9$ $f(1) = 2(1)^3 + (1)^2 - 12(1) + 9$ $= 0$ $\therefore f(x) = (x-1)(2x^2 + 3x - 9)$ $\therefore 0 = (x-1)(x+3)(2x-3)$ $\therefore x = 1 \text{ or / of } x = -3 \text{ or / of } x = \frac{3}{2}$ $D(-3;0), E(1;0), F\left(\frac{3}{2};0\right)$	✓ method / <i>metode</i> ✓ $2x^2 + 3x - 9$ ✓ factorisation / <i>faktorisering</i> ✓ $D(-3;0)$ ✓ $E(1;0)$ ✓ $F\left(\frac{3}{2};0\right)$ (6)
8.3	For concave down / <i>Vir konkaf afwaarts</i> $f''(x) < 0$ $f'(x) = 6x^2 + 2x - 12$ $f''(x) = 12x + 2$ $\therefore 12x + 2 < 0$ $x < -\frac{1}{6}$	✓ $f''(x) < 0$ ✓ $f'(x) = 6x^2 + 2x - 12$ ✓ $f''(x) = 12x + 2$ ✓ $x < -\frac{1}{6}$ (4)
8.4	$6x^2 + 2x - 12 \leq 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-2 \pm \sqrt{2^2 - 4(6)(-12)}}{2 \cdot 6}$ $= \frac{-2 \pm \sqrt{292}}{12}$ $= -1,59 \text{ or / of } 1,26$ $\therefore -1,59 \leq x \leq 1,26$	✓ substitution into correct formula <i>vervanging in die korrekte formule</i> ✓ x-values / <i>x-waardes</i> ✓✓ answer / <i>antwoord</i> <i>(accuracy / akkuraatheid)</i> (4)
		[15]

QUESTION 9/VRAAG 9

Area of/van $\Delta PBA = \frac{1}{2}bh = \frac{1}{2} \times t \times 12 = 6t \text{ cm}^2$ Area of/van $\Delta ACS = \frac{1}{2}t(7-t) = \frac{7}{2}t - \frac{t^2}{2} \text{ cm}^2$ Area of/van $\Delta BQC = \frac{1}{2}(12-t)7 = 42 - \frac{7t}{2} \text{ cm}^2$ Area of rectangle/van reghoek: $PBQS = 12 \times 7 = 84 \text{ cm}^2$ $\therefore$ Area of/van ΔABC: $A(t) = 84 - 6t - \frac{7t}{2} + \frac{t^2}{2} - 42 + \frac{7t}{2}$ $= \frac{1}{2}t^2 - 6t + 42$ $a > 0$, so $A(t)$ is a min graph / is 'n min grafiek $A'(t) = t - 6$ At min / By min : $A'(t) = 0$ $\therefore t - 6 = 0$ $t = 6$ Smallest area / Kleinste oppervlakte: $A(6) = \frac{1}{2}(6)^2 - 6(6) + 42$ $= 24 \text{ cm}^2$	✓ Area of/van ΔPBA ✓ Area of/van ΔACS ✓ Area of/van ΔBQC ✓ subtracting from 84 / trek van 84 af ✓ $A'(t) = 0$ ✓ smallest area / kleinste area (6) [6]
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QUESTION 10/VRAAG 10

10.1		Correct entries of: Korrekte waarde van: ✓ 12 ✓ 5 ; 12 ; 24 ✓ $2y+3$; y ; y ✓ x
10.2	$x + y + 5 + 24 = 60$ $x + y = 31$ $2y + 3 + x + 5 + 12 = x + y + 12 + 24$ $2y + x + 20 = x + y + 36$ $\therefore y = 16 \text{ and/en } x = 15$	✓ $x + y + 5 + 24 = 60$ ✓ $2y + 3 + x + 5 + 12 = x + y + 12 + 24$ ✓ $y = 16$ and/en ✓ $x = 15$ (4)
10.3	$P(M \text{ or/of } (P \text{ and/en } A)) = \frac{2y + 3 + 5 + 12 + x + 24}{135}$ $= \frac{35 + 5 + 12 + 15 + 24}{135}$ $= \frac{91}{135} \text{ or/of } 0,67$	✓ $2y + 3 + 5 + 12$ ✓ 24 ✓ answer / antwoord (3)
		[11]

QUESTION 11/VRAAG 11

11.1	$7! = 5\,040$ ways / maniere	✓ ✓ 7! (2)
11.2	Sample space/Steekproefruimte: 5423121 Possible outcomes/Moontlike uitkomst: 3222113 Probability/Waarskynlikheid = $\frac{3 \times 2 \times 2 \times 2 \times 1 \times 1 \times 3}{5 \times 4 \times 2 \times 3 \times 1 \times 2 \times 1}$ $= \frac{72}{240}$ $= \frac{3}{10} = 0,3$	✓ arrangement / rangskikking ✓ arrangement / rangskikking ✓ $3 \times 2 \times 2 \times 2 \times 1 \times 1 \times 3$ and/en $5 \times 4 \times 2 \times 3 \times 1 \times 2 \times 1$ ✓ answer / antwoord (4)
		[6]

TOTAL/TOTAAL: 150