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SENIOR CERTIFICATE EXAMINATIONS/ SENIORSERTIFIKAAT-EKSAMEN NATIONAL SENIOR CERTIFICATE EXAMINATIONS/ NASIONALE SENIORSERTIFIKAAT-EKSAMEN

MATHEMATICS P1/WISKUNDE V1

MARKING GUIDELINES/NASIENRIGLYNE

2022

MARKS: 150 *PUNTE: 150*

These marking guidelines consist of 16 pages. *Hierdie nasienriglyne bestaan uit 16 bladsye.*

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NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- Consistent Accuracy applies in all aspects of the marking guidelines.

LET WEL:

- Indien 'n kandidaat 'n vraag TWEE keer beantwoord, merk slegs die EERSTE poging.
- Volgehoue akkuraatheid is DEURGAANS op ALLE aspekte van die nasienriglyne van toepassing.

1.1.1	$x^2 + 2x - 15 = 0$	✓ factors	
	(x+5)(x-3)=0	$\checkmark x = -5$	
	x = -5 or $x = 3$	$\checkmark x = 3$	(3)
1.1.2	$5x^2 - x - 9 = 0$		
	$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(5)(-9)}}{2(5)}$	✓ substitution into the correct formula	
	$x = \frac{1 \pm \sqrt{181}}{10}$		
	$x = \frac{10}{10}$ x = 1,45 or $x = -1,25$	$\checkmark x = 1,45$ $\checkmark x = -1,25$	(3)
1.1.3	$x^2 \le 3x$		
	$x^2 - 3x \le 0$	✓ standard form	
	$x(x-3) \le 0$	✓ factors	
	$0 \le x \le 3 \text{OR} \qquad x \in [0;3]$	✓✓ answer	(4)
1.2.1	$a + \frac{64}{a} = 16$		
	$a^2 - 16a + 64 = 0$	✓ standard form	
	$(a-8)^2=0$	✓ factors	
	a=8	✓ answer	
		<i>and</i> 77 01	(3)

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1.2.2	$2^x + 2^{6-x} = 16$		
	$2^x + \frac{64}{2^x} = 16$	✓ exp law	
	$2^{x} = 8 \text{ (from 1.2.1)}$	$\checkmark 2^x = 8$	
	$2^{x} = 2^{3}$		
	x=3	✓ answer	(3)
1.3	$\sqrt{\frac{2^{1002}(1+2^4)}{17(2)^{998}}}$	✓ common factor ✓ second factor	
	$=\sqrt{\frac{2^4(17)}{17}}$	✓ simplification	
	$=\sqrt{2^4}$		
	$=2^2$		
	= 4	✓answer	(4)
1.4	$2x - y = 2 \dots (1)$	l	I
	$\frac{1}{x} - 3y = 1 \qquad \dots (2)$		
	y = 2x - 2	$\checkmark y = 2x - 2$	
	$\frac{1}{x} - 3(2x - 2) = 1$	✓substitution	
	$\frac{1}{x} - 6x + 6 - 1 = 0$	✓simplification	
	$1 - 6x^2 + 6x - x = 0$		
	$-6x^2 + 5x + 1 = 0$	✓ standard form	
	$6x^{2} - 5x - 1 = 0$ $(6x + 1)(x - 1) = 0$, standard form	
	$x = -\frac{1}{6} \text{or} x = 1$	✓x-values	
	$y = 2\left(-\frac{1}{6}\right) - 2$ or $y = 2(1) - 2$		
	$y = -\frac{7}{3} \text{or} y = 0$	✓y-values	(6)

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OR/OF

$$x = \frac{2+y}{2}$$
 ...(1)

OR/OF

$$\frac{1}{x} - 3y = 1$$
 ...(2)

$$\checkmark x = \frac{2+y}{2}$$

$$\frac{1}{\frac{2+y}{2}} - 3y = 1$$

$$\frac{2}{2+y} - 3y = 1$$

$$\frac{2 - 6y - 3y^2}{2 + y} = 1$$

$$2 - 6y - 3y^2 = 2 + y$$

$$-3y^2 - 7y = 0$$

$$-y(3y+7)=0$$

✓ standard form

$$y = 0$$
 or $y = -\frac{7}{3}$

$$x = 1$$
 or $x = -\frac{1}{6}$

✓y-values

 $\checkmark x$ -values

(6) [**26**]

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2.1.1	a + 6d = 35			
	-1+6d=35		✓ substitution	
	6d = 36			
	d = 6	ANGWED ONLY	✓answer	(2)
	OR/OF	ANSWER ONLY:	OR/OF	(2)
		FULL MARKS	✓ substitution	
	$\frac{35-(-1)}{7-1}=6$		✓answer	(2)
2.1.2	, 1		· answer	(2)
2.1.2	$T_n = a + (n-1)d$		✓ substitution into the	
	473 = -1 + (n-1)(6)	ANSWER ONLY:	correct formula	
	79 = n - 1	FULL MARKS	✓ equating to 473	
	$\therefore n = 80$		✓ answer	(3)
2.1.3	n c			
2.1.3	$S_n = \frac{n}{2} [2a + (n-1)d]$			
	$S_{40} = \frac{40}{2} [2(-1) + (40 - 1)(6)]$)]	✓ substitution	
	$\therefore S_{40} = 4640$		✓answer	(2)
	OR/OF		OR/OF	
	$T_{40} = 6(40) - 7$			
	= 233			
	$S_n = \frac{n}{2}(a+l)$			
	$=\frac{40}{2}(-1+233)$		✓ substitution	
	= 4640		✓answer	(2)
2.2.1			· answer	(2)
	75 53 -22 -1	8 / 35 / 21		
	$T_5 = 11$	7	✓answer (A)	(1)
2.2.2	$T_n = an^2 + bn + c$		$\checkmark T_n = an^2 + bn + c$	
	2a = 4			
	a=2			
	3a + b = -22		$\checkmark a = 2$	
	6+b=-22 $b=-28$		$\checkmark b = -28$	
	$\begin{vmatrix} b 2\delta \\ a + b + c = 75 \end{vmatrix}$		0 - 20	
	2-28+c=75			
	c = 101		$\checkmark c = 101$	
	$T_n = 2n^2 - 28n + 101$			(4)
L			1	

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2.2.3 Minimum value of T_n

$$n = -\frac{b}{2a} = -\frac{(-28)}{2(2)}$$

$$n = 7$$

Minimum value of $T_n = 2(7)^2 - 28(7) + 101 = 3$

Each term in the new pattern is $-\frac{1}{5}$ the value of the terms in the old pattern.

Maximum value of new pattern = $-\frac{3}{5}$

$$\checkmark n = 7$$

✓ min value = 3

 $\checkmark -\frac{1}{5}$ value of term of old pattern

 \checkmark max value = $-\frac{3}{5}$ (4)

OR/OF

$$T_n' = 4n - 28$$
$$4n - 28 = 0$$
$$4n = 28$$
$$n = 7$$

Minimum value of $T_n = 2(7)^2 - 28(7) + 101 = 3$

Each term in the new pattern is $-\frac{1}{5}$ the value of the terms in the old pattern.

Maximum value of new pattern = $-\frac{3}{5}$

 $\checkmark n = 7$

OR/OF

✓ min value = 3

 $\checkmark -\frac{1}{5}$ value of term of old pattern

(4)

✓ max value = $-\frac{3}{5}$

OR/OF

$$T_n = -\frac{2}{5}n^2 + \frac{28}{5}n - \frac{101}{5}$$
$$n = -\frac{b}{2a} = \frac{-\frac{28}{5}}{2\left(\frac{-2}{5}\right)}$$

$$T_7 = -\frac{3}{5}$$

OR/OF

$$\checkmark \checkmark T_n \div (-5)$$

 $\checkmark n = 7$

$$\checkmark$$
 max value = $-\frac{3}{5}$ (4)

OR/OF

OR/OF

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$$T_{n} = -\frac{2}{5}n^{2} + \frac{28}{5}n - \frac{101}{5}$$

$$T_{n}' = -\frac{4}{5}n + \frac{28}{5}$$

$$-\frac{4}{5}n + \frac{28}{5} = 0$$

$$-4n = -28$$

$$n = 7$$

Minimum value of $T_n = 2(7)^2 - 28(7) + 101 = 3$

Each term in the new pattern is $-\frac{1}{5}$ the value of the terms in the old pattern.

Maximum value of new pattern = $-\frac{3}{5}$

$$\checkmark$$
 max value = $-\frac{3}{5}$ (4)

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3.1.1	T au ⁿ⁻¹	
	$T_n = ar^{n-1}$ $T_{10} = 1024 \left(\frac{1}{4}\right)^{10-1}$ $T_{10} = \frac{1}{256}$ ANSWER ONLY: FULL MARKS	✓ substitution into the correct formula ✓ answer (2)
3.1.2	$\sum_{p=0}^{8} 256 \left(4^{1-p} \right) = 1024 + 256 + 64 + \dots$ $S_n = \frac{a \left[1 - r^n \right]}{1 - r}$	✓ 1024
	$S_9 = \frac{1024 \left[1 - \left(\frac{1}{4} \right)^9 \right]}{1 - \frac{1}{4}}$ $R = \frac{87381}{1 - \frac{1}{4}}$	✓ n = 9 ✓ substitution into the correct formula
	$S_9 = \frac{87381}{64}$ $= 1365,33$	✓answer (4)
	OR/OF $\sum_{p=0}^{8} 256 (4^{1-p})$	OR/OF
	$=1024 + 256 + 64 + 16 + 4 + 1 + \frac{1}{4} + \frac{1}{16} + \frac{1}{64}$ $S_9 = \frac{87381}{64}$ $=1365,33$	✓ 1024 ✓ rest of expansion ✓ $n = 9$ terms
3.2		✓ answer (4)
3.2	$-t^{2}-6t-9; \frac{t^{3}+9t^{2}+27t+27}{2}$ $-(t^{2}+6t+9); \frac{1}{2}(t+3)(t^{2}+6t+9)$	$\checkmark r = \frac{t^3 + 9t^2 + 27t + 27}{2}$ $-t^2 - 6t - 9$
	$-(t+3)^{2}; \frac{1}{2}(t+3)^{3}$ $r = \frac{-(t+3)}{2}$	$\checkmark -(t^2 + 6t + 9)$ $\checkmark \frac{1}{2}(t+3)(t^2 + 6t + 9)$
	$ \begin{array}{c c} $	$\checkmark -1 < \frac{-t-3}{2} < 1$
	1<-t<5	-
	-5 < t < -1	✓ answer (5) [11]

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$10 = a \left(\frac{1}{3}\right)^{-2} + 7$ $3 = 9a$		✓ subs (-2; 10)
$\therefore a = \frac{1}{3}$		✓ simplification
3		✓ answer (3)
4.2 $y = g(0)$		
$y = \frac{1}{3} \times \left(\frac{1}{3}\right)^0 + 7$		✓ substitution of $x = 0$
$y = \frac{22}{3} = 7,33$ $\therefore \left(0; \frac{22}{3}\right)$	ANSWER ONLY: FULL MARKS	✓ answer (2)
4.3.1 Translation by 1 to downwards	nit to the right and 7 units	✓ 1 unit right ✓ 7 units downwards (2)
$h(x) = \left(\frac{1}{3}\right)^{x}$ $h^{-1}: x = \left(\frac{1}{3}\right)^{y}$	ANSWER ONLY: FULL MARKS $y = -\log_3(x)$	✓ swap x and y ✓ answer
		(2) [9]

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5.1	$g(x) = \frac{a}{x+2} + q$	$\checkmark g(x) = \frac{a}{x+2} + q$
	Subs (1; 0):	
	$0 = \frac{a}{1+2} + q$	
	0 = a + 3q	$\checkmark 0 = a + 3q$
	Subs $\left(0; -\frac{1}{2}\right)$	
	$-\frac{1}{2} = \frac{a}{0+2} + q$	
	-1=a+2q	$\checkmark -1 = a + 2q$
	Solving simultaneously:	✓ solving simultaneously
	q=1	$\checkmark q = 1$
	a = -3	$\checkmark a = -3$
		(6)
	$\therefore g(x) = \frac{-3}{x+2} + 1$	
5.2	$y \in \mathbb{R}; \ y \neq 1$	✓ answer
	OR/OF	(1)
	$(-\infty;1)$ or $(1;\infty)$	
	OR/OF	
	y < 1 or $y > 1$	
5.3	y-1=1(x+2) OR/OF $1=1(-2)+c$	✓ m = 1
	ANSWER ONLY: $c = 3$	\checkmark subs point $(-2;1)$
	y = x + 3 FULL MARKS $y = x + 3$	✓ answer
	T OEE I'M MAIL	(3)
5.4	K' (-3; 4)	✓ x-value
3.1	X (3 , T)	✓ y-value
		(2)
		[12]
		-

6.1	$f(x) = -x^2 - 6x + 7$		
	f'(x) = -2x - 6		
	$-2x-6=0$ OR/OF $x=-\frac{(-6)}{2(-1)}$	✓ method	
	x = -3 ANSWER ONLY:	✓ <i>x</i> -value	
	E(-3; 16) FULL MARKS	✓ y-value	(2)
6.2	k = f(-5)		(3)
0.2	$k = -(-5)^2 - 6(-5) + 7$		
	$\therefore k = 12$	✓ answer (A)	(1)
6.3	C(0;7)	✓ coordinates of C	
	D(-5; 12)		
	$m_{CD} = \frac{12-7}{-5-0}$	✓ substitution	
	$m_{CD} = -1$	✓ m	
	Equation of CD:	m in the second	
	y = -x + 7	✓ answer	
6.4	-2x-6=-1		(4)
0.4	$\begin{vmatrix} -2x - 6 = -1 \\ -2x = 5 \end{vmatrix}$	$\checkmark f'(x) = -2x - 6$	
	$x = -\frac{5}{2}$	✓ equating to -1 ✓ x -value	
	$x = -\frac{1}{2}$	× x-value	
	$y = f\left(\frac{-5}{2}\right) = -\left(\frac{-5}{2}\right)^2 - 6\left(\frac{-5}{2}\right) + 7 = \frac{63}{4} = 15,75$	✓ y-value (A)	(4)
	$\therefore P\left(-\frac{5}{2}; \frac{63}{4}\right)$		
6.5	Point by symmetry: (-1; 12)	<u> </u>	
	-5 < x < -1	✓ answer	
	OR/OF		(2)
	$-x^2 - 6x + 7 > 12$ ANSWER ONLY:		
	$-x^2-6x-5>0$ FULL MARKS		
	$x^2 + 6x + 5 < 0$		
	(x+1)(x+5)<0	✓ -1 ✓ answer	
	-5 < x < -1	answer	(2)
			[14]

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7.1	A D(1 : 1) n	
7.1	$A = P(1+i)^n$	\downarrow \searrow \searrow In
	$2 = 1\left(1 + \frac{0.085}{4}\right)^{4n}$	$\begin{array}{ c c c c }\hline \checkmark 2 & & \text{In} \\ \checkmark & 0.085 \\ \hline \checkmark & & \text{formula} \\ \hline \end{array}$
	4)	$\sqrt{\frac{0,085}{4}}$ correct formula
	$4n = \log_{\left(1 + \frac{0.085}{4}\right)} 2$	✓ use of logs
	n = 8,24 years	✓ answer in years
		(4)
7.2.1	$A = P(1-i)^n$	(1 :
	$180\ 000 = 500\ 000(1-i)^5$	✓ subs into correct formula
	$\frac{9}{25} = \left(1 - i\right)^5$	
	$\sqrt[5]{\frac{9}{25}} = 1 - i$	✓ simplification
	V25 1 1	$\checkmark i = 0.1848$
	i = 0.1848068	<i>i</i> = 0,1646
	r = 18,48%	✓ answer
		(4)
7.2.2	$A = P(1+i)^n$	✓ subs into correct
	$A = 500 \ 000(1 + 0.063)^5$	formula
	A = R678 635,11	✓ answer
		(2)
7.2.3	Sinking Fund = 678 635,11 – 180 000 = R 498 635,11	✓ value of sinking fund
	- K 490 033,11	value of shiking fund
	$[(1, 0,1025)^{58}, (1, 0,1025)^{3}]$	✓ <u>0,1025</u>
	$x \left[\left(1 + \frac{1}{12} \right) - 1 \left[1 + \frac{1}{12} \right] \right]$	12
	498 635,11 = 0,1025	$\checkmark n = 58 \text{ (A)}$
	$\frac{3,322}{12}$	$\sqrt{1+\frac{0{,}1025}{12}}$
	x = R6510,36	12)
		✓ answer (A) (5)
		[15]
L	<u> </u>	

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QUESTI	ON/VRAAG 8	
8.1	$f(x) = -x^2$	
	$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$	
	$f'(x) = \lim_{h \to 0} \frac{-(x+h)^2 + x^2}{h}$	✓ substitution into formula
	$f'(x) = \lim_{h \to 0} \frac{-x^2 - 2xh - h^2 + x^2}{h}$	$\checkmark -(x^2 + 2xh + h^2)$
	$=\lim_{h\to 0}\frac{-2xh-h^2}{h}$	$\checkmark -2xh-h^2$
	$= \lim_{h \to 0} \frac{h(-2x - h)}{h}$ $= \lim_{h \to 0} (-2x - h)$	\checkmark - 2x - h
	$=\lim_{h\to 0}(-2x-h)$	
	$\therefore f'(x) = -2x$	✓answer (5)
	$ \begin{array}{l} \mathbf{OR}/\mathbf{OF} \\ f(x) = -x^2 \end{array} $	OR/OF
	$f(x+h) = -(x+h)^2 = -x^2 - 2xh - h^2$	$\checkmark -x^2 - 2xh - h^2$
	$f(x+h)-f(x)=-x^2-2xh-h^2-(-x^2)=-2xh-h^2$	$\checkmark -2xh-h^2$
	$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$	
	$=\lim_{h\to 0}\frac{-2xh-h^2}{h}$	✓ substitution into the formula
	$=\lim_{h\to 0}\frac{h(-2x-h)}{h}$	\checkmark - 2x - h
	$= \lim_{h \to 0} (-2x - h)$ $\therefore f'(x) = -2x$	
		✓answer (5)
8.2.1	$f(x) = 4x^3 - 5x^2$	$\checkmark 12x^2$ (A)
	$f'(x) = 12x^2 - 10x$	$\checkmark -10x \text{ (A)} \tag{2}$
8.2.2	$D_x \left[\frac{-6\sqrt[3]{x} + 2}{x^4} \right]$	
	$=D_{x}\left[\frac{-6(x)^{\frac{1}{3}}}{x^{4}} + \frac{2}{x^{4}}\right]$	$\checkmark x^{\frac{1}{3}}$
	$= D_x \left[-6x^{-\frac{11}{3}} + 2x^{-4} \right]$	$\checkmark -6x^{-\frac{11}{3}} + 2x^{-4}$
	$\begin{bmatrix} -D_x \\ \end{bmatrix}$	$\checkmark -6x^{-3} + 2x$ $\checkmark 22x^{-\frac{14}{3}}$
	$=22x^{-\frac{14}{3}}-8x^{-5}$	$\checkmark 22x^{-\frac{1}{3}}$
	-22λ -6λ	$\sqrt{-8x^{-5}}$ (4)
		[11]

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9.1	$f(x) = (x+t)^2(x-3)$	$\checkmark f(x) = (x+t)^2(x-3)$
	$-3 = (0+t)^2 (0-3)$	\checkmark subs $(0; -3)$
	$1=t^2$	
	$t = \pm 1$	$\checkmark t$
	$\therefore t = 1$	
	$f(x) = (x+1)^2(x-3)$	$f(x) = (x+1)^2(x-3)$
	$f(x) = (x^2 + 2x + 1)(x - 3)$	✓ expansion
	$f(x) = x^3 - x^2 - 5x - 3$	(5)
9.2	$f'(x) = 3x^2 - 2x - 5$	$f'(x) = 3x^2 - 2x - 5$
	$0 = 3x^2 - 2x - 5$	✓ = 0
	0 = (x+1)(3x-5)	✓ factors
	$x = -1 \text{ or } x = \frac{5}{3}$	✓ x -value ($x > 0$)
] 3	
	$N\left(\frac{5}{3}; -\frac{256}{27}\right) = (1,67; -9,48)$	\checkmark y-value (A) (5)
9.3.1	$x < 3 \; ; \; x \neq -1$	✓ x < 3
	ODIOE	$\checkmark x \neq -1 \tag{2}$
	$ \begin{array}{c cccc} \mathbf{OR}/\mathbf{OF} \\ x < -1 & \text{or } -1 < x < 3 \end{array} $	OR/OF $\checkmark x < -1$
		$\checkmark -1 < x < 3 \tag{2}$
	OR/OF	OR/OF
	$(-\infty; -1)$ or $(-1; 3)$	$\checkmark (-\infty; -1)$ $\checkmark (-1; 3)$ (2)
9.3.2	5 OP/OF 6 1 - 5	$\checkmark x < -1$
	$x < -1$ or $x > \frac{5}{3}$ OR/OF $x \le -1$ or $x \ge \frac{5}{3}$	$\checkmark x > \frac{5}{2} \tag{2}$
	OR/OF	3 OR/OF
	$\left(-\infty;-1\right)$ or $\left(\frac{5}{3};\infty\right)$ OR/OF $\left(-\infty;-1\right]$ or $\left[\frac{5}{3};\infty\right)$	$\checkmark (-\infty; -1)$ $\checkmark \left(\frac{5}{3}; \infty\right) $ (2)
0.2.2		(3,3)
9.3.3	f''(x) > 0	\checkmark 6x-2
	6x-2>0 ANSWER ONLY:	
	$x > \frac{1}{3}$ or $\left(\frac{1}{3}; \infty\right)$ FULL MARKS	$\sqrt{\frac{1}{3}}$
		$\checkmark x > \frac{1}{3} \tag{3}$
	OR/OF	OR/OF
	$\frac{\frac{5}{3} + (-1)}{2} = \frac{1}{3}$	✓ substitution
	${2} = {3}$	$\sqrt{\frac{1}{3}}$
	$x > \frac{1}{3}$ or $\left(\frac{1}{3}; \infty\right)$	$\checkmark x > \frac{1}{2} $ (3)
	3 (3')	$\checkmark x > \frac{1}{3} \tag{3}$

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9.4	Distance = $x^3 - x^2 - 5x - 3 - (3x^2 - 2x - 5)$	
	$= x^3 - 4x^2 - 3x + 2$	$\sqrt{x^3 - 4x^2 - 3x + 2}$
	$\frac{d\text{Distance}}{dx} = 3x^2 - 8x - 3$	$\checkmark \frac{d\text{Distance}}{dx} = 3x^2 - 8x - 3$
	$0 = 3x^{2} - 8x - 3$ 0 = (3x + 1)(x - 3)	✓ factors
	$x = 3 \text{ or } x = -\frac{1}{3}$	✓ x-values
	Max distance	
	$= \left(-\frac{1}{3}\right)^3 - 4\left(-\frac{1}{3}\right)^2 - 3\left(-\frac{1}{3}\right) + 2$	$\checkmark x = -\frac{1}{3}$
	$=\frac{68}{27}=2,52$	✓ answer
		(6)
		[23]

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10.1.2 $4! \times 4!$ = 576 $4! \times 4! $	QUESTI	ON/VRAAG 10		
10.1.2	10.1.1	7! = 5 040	✓✓ answer	(2)
	10.1.2	$A! \times A!$	V 11	(-/
P(African flags together) = $\frac{576}{5040}$	10.1.2			
10.2 P(A or B) = P(A) + P(B) - P(A and B)			4! × 4!	
0,88 = 0,4 + P(B) – P(A and B) 0,88 = 0,4 + P(B) – 0,4P(B) 0,48 = 0,6P(B) P(B) = 0,8 10.3 First Passenger Second Passenger M 120-x 119 M 120-x 119 M 120-x 119 Probability of first passenger choosing meat = $\frac{x}{120}$ Probability of second passenger choosing cheese = $\frac{120-x}{119}$ $\frac{x}{120} \times \frac{120-x}{119} = \frac{18}{85}$ $120x-x^2 = 3\ 024$ $x^2 - 120x + 3\ 024 = 0$ $(x-84)(x-36) = 0$ $x = 84$ or $x = 36$ \therefore P(1st cheese) = $\frac{36}{120} = \frac{3}{10}$ (5)		P(African flags together) = $\frac{576}{5040}$ $\left(=\frac{4}{35}=0,11\right)$	✓ answer (A)	(3)
P(B) = 0,8 P(B) = 0,8 First Passenger Second Passenger M $ \frac{x}{120} M $ $ \frac{120-x}{119} M $ Probability of first passenger choosing meat = $\frac{x}{120}$ Probability of second passenger choosing cheese = $\frac{120-x}{119}$ $ \frac{x}{120} \times \frac{120-x}{119} = \frac{18}{85} $ $ \frac{x}{120} \times \frac{120-x}{119} = \frac{18}{85} $ $ 120x - x^2 = 3 024 $ $ x^2 - 120x + 3 024 = 0 $ $ (x - 84)(x - 36) = 0 $ $ x = 84 \text{or} x = 36 $ $ \therefore P(1^{st} \text{ cheese}) = \frac{36}{120} = \frac{3}{10} $ (5)	10.2	0.88 = 0.4 + P(B) - P(A and B) 0.88 = 0.4 + P(B) - 0.4P(B)		
First Passenger Second Passenger			√ anewer	
First Passenger Second Passenger M $ \frac{x}{120} = \frac{x}{119} $ Probability of first passenger choosing meat = $\frac{x}{120}$ Probability of second passenger choosing cheese = $\frac{120 - x}{119}$ $ \frac{x}{120} \times \frac{120 - x}{119} = \frac{18}{85} $ $ \frac{x}{120} \times \frac{120 - x}{119} = \frac{18}{85} $ $ 120x - x^2 = 3 024 $ $ x^2 - 120x + 3 024 = 0 $ $ (x - 84)(x - 36) = 0 $ $ x = 84 \text{ or } x = 36 $ $ \therefore P(1^{st} \text{ cheese}) = \frac{36}{120} = \frac{3}{10} $ (5)		$\Gamma(\mathbf{D}) = 0.0$	· answer	(2)
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$x = 84$ or $x = 36$ $\therefore P(1^{st} \text{ cheese}) = \frac{36}{120} = \frac{3}{10}$ (5)				
$\therefore P(1^{\text{st} \text{ cheese}}) = \frac{36}{120} = \frac{3}{10}$ (5)		(x-84)(x-36) = 0		
120 10		x = 84 or $x = 36$	$\checkmark x = 84 \text{ or } x = 36$	
120 10				
120 10		36 3	$\sqrt{\frac{3}{2}}$	(5)
120 10		\therefore P(1 st cheese) = $\frac{50}{120}$ = $\frac{5}{10}$	10	(3)
[13]		120 10		# A # -
<u> </u>				[13]