

WAARSKYNLIKHEID

Oplossings

Die DBE se eie nasienriglyne, in boekvolgorde

Elke oplossing hier is 'n uitknipsel van die amptelike DBE-nasienriglyn wat saam met die vraestel gepubliseer is waaruit die vraag kom. Die bewerking, die punt-merke en die aanvaarde alternatiewe is die DBE se eie. Niks is oorgeskryf of oor afgelei nie.

Die nommers pas by die vraeboek: oplossing 34 antwoord vraag 34, en die hoofstukke is in dieselfde volgorde.

Die DBE skryf een riglyn vir albei tale, so hierdie bladsye is tweetalig en hul nasienaantekeninge is grootliks in Engels. Dit is die DBE se eie bladsy, presies soos gedruk weergegee.

'n Nasienriglyn word vir nasieners geskryf, nie vir leerders nie. Dit wys die kortste pad na die punte, so waar 'n stap saamgepers lyk, is dit die riglyn wat bondig is eerder as 'n stap wat ontbreek.

1. Onderling uitsluitende gebeurtenisse, dan 'n dobbelsteen en 'n kaart saam

Amptelike DBE-nasienriglyn · Mei/Junie 2025 · V10 · 8 punte

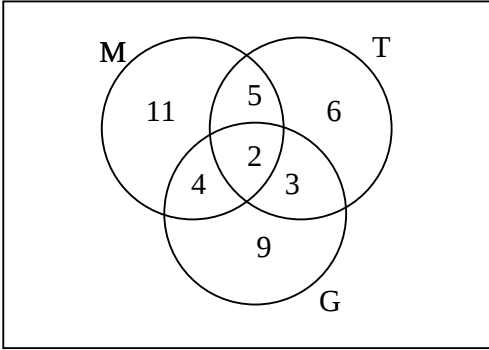
QUESTION/VRAAG 10

10.1	$P(A \text{ or } B) = P(A) + P(B)$ $P(B) = P(A \text{ or } B) - P(A)$ $= 0,79 - 0,42$ $= 0,37$	✓ substitution ✓ answer (2)
10.2	People pay: R2 600 $0,7 \times R2\ 600 = R1\ 820$ Total value of pay-outs = R2 600 – R1 820 = R780 $P(\text{someone to win}) = \frac{16}{52} \times \frac{1}{2}$ $= \frac{2}{13}$ Total number of people winning = $\frac{2}{13} \times 260$ = 40 $\therefore \text{Pay-out} = \frac{R780}{40}$ = R19,50 per person winning OR/OF People pay: R2 600 Total value of pay-outs = $0,3 \times R2\ 600$ = R780 $P(\text{someone to win}) = \frac{16}{52} \times \frac{1}{2}$ $= \frac{2}{13}$ Total number of people winning = $\frac{2}{13} \times 260$ = 40 $\therefore \text{Pay-out} = \frac{R780}{40}$ = R19,50 per person winning	✓ R1 820 ✓ amount willing to pay-out ✓ $\frac{16}{52}$ ✓ $\frac{2}{13}$ ✓ winners ✓ pay-out (6) OR/OF ✓ $0,3 \times R2\ 600$ ✓ amount willing to pay-out ✓ $\frac{16}{52}$ ✓ $\frac{2}{13}$ ✓ winners ✓ pay-out (6)
		[8]

2. Drie eksamens in een Venn-diagram

Amptelike DBE-nasienriglyn · November 2024 · V11 · 9 punte

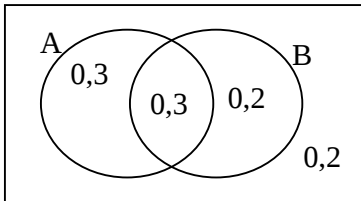
QUESTION/VRAAG 11

11.1		✓2 ✓3; 4; 5 ✓6; 9; 11 (3)
11.2	$P(\text{at least two subjects}) = \frac{4 + 2 + 5 + 3}{40} = \frac{14}{40} = \frac{7}{20} = 0,35$	✓ (4 + 2 + 5 + 3) or 14 in numerator ✓ 40 in denominator (2)
11.3	$P(M) \times P(T) = \frac{22}{40} \times \frac{16}{40} = \frac{11}{50} = 0,22$ $P(M \text{ and } T) = \frac{7}{40} = 0,175$ $P(M) \times P(T) \neq P(M \text{ and } T)$ Events M and T are not independent	✓ $\frac{22}{40} \times \frac{16}{40}$ ✓ $\frac{11}{50}$ ✓ $\frac{7}{40}$ ✓ answer (4)
		[9]

3. Onafhanklik of onderling uitsluitend? Dan twaalf boeke op 'n rak

Amptelike DBE-nasienriglyn · November 2021 · V12 · 14 punte

QUESTION/VRAAG 12

12.1.1	No, because $P(A \text{ and } B) \neq 0$	✓ answer and reason (1)								
12.1.2(a)	$P(A \text{ and } B) = 0,3$ $P(\text{only } B) = 0,2$ $P(A \text{ and } B) = P(A) \times P(B)$ $0,3 = P(A) \times 0,5$ $P(A) = 0,6$ $P(\text{only } A) = 0,3$	✓ $P(A \text{ and } B) = P(A) \times P(B)$ ✓ 0,5 ✓ $P(A) = 0,6$ ✓ answer (4)								
12.1.2(b)	 $P(\text{not } A \text{ or not } B) = 0,2 + 0,2 + 0,3 = 0,7$ OR/OF $P(\text{not } A \text{ or not } B) = 1 - P(A \text{ and } B) = 1 - 0,3 = 0,7$ OR/OF $P(A' \text{ or } B') = P(A') + P(B') - P(A' \text{ and } B')$ $= 0,4 + 0,5 - 0,2 = 0,7$	✓ method ✓ answer (2) OR/OF ✓ method ✓ answer (2) OR/OF ✓ method ✓ answer (2)								
12.2.1	$P(\text{novel}) = \frac{3}{12} = \frac{1}{4}$	✓ answer (1)								
12.2.2	$12! = 479\,001\,600$	✓✓ answer (2)								
12.2.3	<table border="1"><tr><td>5</td><td>3!</td><td>8!</td><td>4</td></tr><tr><td>(Poetry)</td><td>(Novels all together)</td><td>(Arrangements of rest of the books including the novels)</td><td>(Drama)</td></tr></table> $P(\text{start with poetry, end with drama AND all novels together})$ $= \frac{5 \times 3! \times 8! \times 4}{12!}$ $= \frac{1}{99}$	5	3!	8!	4	(Poetry)	(Novels all together)	(Arrangements of rest of the books including the novels)	(Drama)	✓ 5×4 ✓ $3! = 6$ ✓ $8!$ $\checkmark \frac{5 \times 3! \times 8! \times 4}{12!} = \frac{1}{99} \text{ (A)}$ (4)
5	3!	8!	4							
(Poetry)	(Novels all together)	(Arrangements of rest of the books including the novels)	(Drama)							
		[14]								

TOTAL/TOTAAL: 150

4. P(B) uit onderling uitsluitende gebeurtenisse, dan wat 'n leerder koop

Amptelike DBE-nasienriglyn · Mei/Junie 2024 · V11 · 14 punte

QUESTION 11/VRAAG 11

11.1	$P(A) + P(B) = 0,52$ $0,4 + P(B) = 0,52$ $P(B) = 0,12$	✓ substitution ✓ answer (2)
11.2.1	$P(\text{sandwich}) = \frac{4}{25}$ OR/OF $0,02 + 0,01 + 0,04 + 0,09 = \frac{4}{25} = 0,16$	✓ answer (1) OR/OF ✓ answer (1)
11.2.2	$P(\text{at least two events}) = 0,02 + 0,01 + 0,03 + 0,04$ $= 0,1$	✓ $0,02 + 0,01 + 0,03 + 0,04$ ✓ answer (2)
11.2.3	$P(\text{not any}) = 1 - (0,1 + 0,04 + 0,09 + 0,2)$ $= 0,57$	✓ $1 - (0,1 + 0,04 + 0,09 + 0,2)$ ✓ answer (2)
11.3.1	$7! = 5040$	✓ $7!$ (1)
11.3.2	$P(4 \text{ players alphabetically}) = \frac{1}{7 \times 6 \times 5 \times 4} = \frac{1}{840}$	✓ 1 ✓ 840 ✓ $\frac{1}{840}$ (3)

11.3.3	<table><tr><td></td><td>F</td><td></td><td>F</td><td></td><td>F</td><td></td><td>F</td><td></td></tr></table> F arrangements: 4! M arrangements: 5 options with 3 males = $5 \times 4 \times 3$ $4! \times 5 \times 4 \times 3$ = 1 440 OR/OF 10 Options: F M F M F M F M F M F M F F F F M F M F M F M F M F F M M F M F F M F M F M F F F M F M F F M F M M F F M F F M M F F M F M F M F F F M F M Hence $10 \times 4! \times 3! = 1440$		F		F		F		F		✓4! ✓$5 \times 4 \times 3$ ✓1 440 (3) OR/OF ✓$4! \times 3!$ ✓$\times 10$ ✓1 440 (3)
	F		F		F		F				
		[14]									
	TOTAL/TOTAAL: 150										

5. Onafhanklike gebeurtenisse, dan 'n opname onder 150 leerders

Amptelike DBE-nasienriglyn · Mei/Junie 2021 · V11 · 15 punte

QUESTION/VRAAG 11

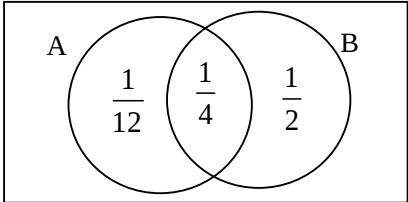
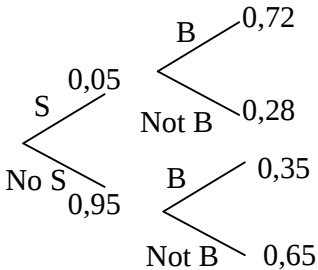
11.1	$P(A) = 1 - P(\text{not } A) = 0,6$ $P(A \text{ and } B) = P(A) \times P(B)$ $= 0,6 \times 0,3$ $= \frac{9}{50}$ $= 0,18$	✓ 0,6 ✓ $P(A \text{ and } B) = P(A) \times P(B)$ ✓ answer (A) (3)
11.2.1	$a = \frac{15}{150} = 0,1$	✓ $\frac{15}{150}$ (A) (1)
11.2.2	$m = 1 - 0,7 = 0,3$	✓ 0,3 (A) (1)
11.2.3	$0,24 + 0,14 + 0,02 + 0,12 + 0,1 + 2b = 0,7$ $2b = 0,08$ $b = 0,04$ $0,04 \times 150 = 6$	✓ addition ✓ simplification ✓ $b = 0,04$ ✓ 6 (4)
11.3.1	$9 \times 9 \times 8 = 648$	✓9 ✓ 9×8 (2)
11.3.2	$2 \times 8 \times 4 = 64$ $2 \times 8 \times 5 = 80$ Total number = $64 + 80 = 144$	✓✓ $2 \times 8 \times 4$ ✓ $2 \times 8 \times 5$ ✓144 (A) (4)
		[15]

TOTAL/TOTAAL: 150

6. Ten minste een gebeurtenis, dan sneeu op die Drakensberg

Amptelike DBE-nasienriglyn · November 2023 · V10 · 15 punte

QUESTION 10/VRAAG 10

10.1.1	$P(A \text{ and } B) = P(A) \times P(B)$ $= \frac{1}{3} \times \frac{3}{4}$ $= \frac{1}{4}$	$\checkmark \frac{1}{3} \times \frac{3}{4}$ $\checkmark \frac{1}{4}$ (2)
10.1.2	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $= \frac{1}{3} + \frac{3}{4} - \frac{1}{4}$ $= \frac{5}{6}$ OR/OF  $P(A \text{ or } B) = \frac{1}{12} + \frac{1}{4} + \frac{1}{2} = \frac{5}{6}$	$\checkmark \text{ substitution}$ $\checkmark \text{ answer}$ (2) OR/OF $\checkmark \text{ substitution}$ $\checkmark \text{ answer}$ (2)
10.2.1		$\checkmark \text{ branch 1 with probabilities}$ $\checkmark \text{ branch 2 with probabilities}$ $\checkmark \text{ branch 3 with probabilities}$ (3)
10.2.2	$P(\text{NOT below } 0^\circ)$ $= P(S; \text{NOT below } 0^\circ) + P(NS; \text{NOT below } 0^\circ)$ $= 0,05 \times 0,28 + 0,95 \times 0,65$ $= 0,6315$	$\checkmark \text{ value of } P(S; \text{NOT below } 0^\circ)$ $\checkmark \text{ value of } P(NS; \text{NOT below } 0^\circ)$ $\checkmark \text{ answer}$ (3)
10.3.1	$n(S) = 10!$	$\checkmark 10!$ (1)

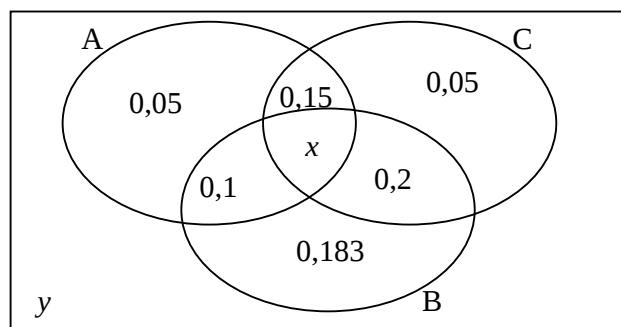
10.3.2	4 Options; $2 \times 8 \times 7 \times 6 \times 5 \times 4 \times 1 \times 3 \times 2 \times 1 = 80\,640$ $8 \times 2 \times 7 \times 6 \times 5 \times 4 \times 3 \times 1 \times 2 \times 1 = 80\,640$ $8 \times 7 \times 2 \times 6 \times 5 \times 4 \times 3 \times 1 \times 1 \times 1 = 80\,640$ $8 \times 7 \times 6 \times 2 \times 5 \times 4 \times 3 \times 2 \times 1 \times 1 = 80\,640$ Total number of possibilities = 322 560 $P(5 \text{ learners in between}) = \frac{322\,560}{10!} = \frac{4}{45}$ OR/OF $2 \times 8 \times 7 \times 6 \times 5 \times 4 \times 1 \times 3 \times 2 \times 1$ 4 possible starting positions $\therefore 4(2 \times 8! \times 1) = 322\,560$ $8(8!) = 322\,560$ $P(5 \text{ learners in between}) = \frac{322\,560}{10!} = \frac{4}{45}$	✓ (2×8!) ✓✓ 4(2 × 8!) or 322 560 ✓ $\frac{322\,560}{n(S)}$ (4) OR/OF ✓ (2×8!) ✓✓ 4(2 × 8!) or 322 560 ✓ $\frac{322\,560}{n(S)}$ (4) [15]
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TOTAL/TOTAAL: 150

7. Drie gebeurtenisse in 'n Venn-diagram, met twee onbekendes

Amptelike DBE-nasienriglyn · November 2022 · V10 · 17 punte

QUESTION 10/VRAAG 10



10.1.1(a)	$y = 1 - 0,893 = 0,107 \text{ (0,11)}$	✓ $y = 1 - 0,893$ (1)
10.1.1(b)	$x = 0,893 - 0,733$ $= 0,16$	✓ $x = 0,893 - 0,733$ (1)
10.1.2	$P(\text{at least 2 events}) = 0,1 + 0,15 + 0,16 + 0,2$ $= 0,61$ Answer only: Full Marks	✓ values ✓ answer (2)
10.1.3	$P(B) = 0,643$ $P(C) = 0,56$ $P(B \text{ and } C) = 0,36$ $P(B) \times P(C) = 0,643 \times 0,56 = 0,36$ $\therefore P(B \text{ and } C) = P(B) \times P(C)$ $\therefore B \text{ and } C \text{ are independent}$	✓ $P(B) = 0,643$ ✓ $P(C) = 0,56$ ✓ $P(B \text{ and } C) = 0,36$ ✓ $P(B) \times P(C) = 0,36$ ✓ independent because $P(B \text{ and } C) = P(B) \times P(C)$ (5)
10.2.1	$7 \times 6 \times 5 \times 4 = 840$	✓ 4 ✓ 7 ✓ $7 \times 6 \times 5 \times 4 = 840$ (3)
10.2.2	start with 5, 7, 9 or start with 6 or start with 8 $(3 \times 5 \times 1 \times 3) + (1 \times 5 \times 1 \times 2) + (1 \times 5 \times 1 \times 2)$ $= 45 + 10 + 10$ $= 65$ $P = \frac{65}{840} = \frac{13}{168} = 0,08$ OR/OF ends in 4 or ends in 6 or ends in 8 $(5 \times 5 \times 1 \times 1) + (4 \times 5 \times 1 \times 1) + (4 \times 5 \times 1 \times 1)$ $= 25 + 20 + 20$ $= 65$ $P = \frac{65}{840} = \frac{13}{168} = 0,08$	✓ $(3 \times 5 \times 1 \times 3) = 45$ ✓ $(1 \times 5 \times 1 \times 2) = 10$ ✓ $(1 \times 5 \times 1 \times 2) = 10$ ✓ 65 ✓ answer (5) OR/OF ✓ $(5 \times 5 \times 1 \times 1) = 25$ ✓ $(4 \times 5 \times 1 \times 1) = 20$ ✓ $(4 \times 5 \times 1 \times 1) = 20$ ✓ 65 ✓ answer (5)
		[17]

TOTAL/TOTAAL: 150

8. Driesyfergetalle van 501 tot 999

Amptelike DBE-nasienriglyn · Mei/Junie 2025 · V11 · 7 punte

QUESTION/VRAAG 11

11.1	$\frac{1}{\textcircled{5}} \times \frac{9}{\textcircled{5}} \times \frac{9}{\textcircled{5}} = 81$ 500 cannot be included $\therefore$ 80 possibilities $\frac{4}{\textcircled{5}} \times \frac{1}{\textcircled{5}} \times \frac{9}{\textcircled{5}} = 36$ $\frac{4}{\textcircled{5}} \times \frac{9}{\textcircled{5}} \times \frac{1}{\textcircled{5}} = 36$ Total possibilities $= 80 + 36 + 36$ $= 152$ OR 501 to 599: $99 - 10 - 9 = 80$ possibilities 601 to 699: $9 + 9 = 18$ possibilities of having a 5 in the 10's digit or units digit. Thus 601 to 699 $= 4 \times 18$ Total possibilities $= 4 \times 18 + 80$ $= 152$	✓ $1 \times 9 \times 9$ ✓ $4 \times 1 \times 9$ ✓ $4 \times 9 \times 1$ ✓ 152 (4) ✓ 80 ✓ 18 ✓ 4×18 ✓ 152 (4)
11.2	P(not having such a number) $= 1 - \frac{152}{499}$ $= \frac{347}{499}$ $= 0,70$	✓ $n(S) = 499$ ✓ $1 - P(\text{having number})$ ✓ numerator (3)
		[7]

TOTAL/TOTAAL: 150

9. 'n Vierkarakterkode, met herhaling en sonder herhaling

Amtelike DBE-nasienriglyn · November 2024 · V12 · 8 punte

QUESTION/VRAAG 12

12.1	$26 \times 10 \times 26 \times 10 = 67\ 600$	✓for correct letters ✓for correct digits (2)
12.2	$18 \times 9 \times 19 \times 5 = 15\ 390$	Given that its multiplication ✓ 18 ✓ 19 ✓ 9 ✓ 5 (4)
12.3	$24 \times 9 \times 25 \times 5 = 27\ 000$ $\frac{27\ 000 - 15\ 390}{15\ 390} \times 100 = 75,44\%$	✓ $24 \times 9 \times 25 \times 5$ ✓ answer (2)
		[8]

TOTAL/TOTAAL: 150

10. Sewe vlae in 'n ry, en die kans dat hulle per vasteland val

Amptelike DBE-nasienriglyn · Mei/Junie 2022 · V10 · 13 punte

QUESTION/VRAAG 10

10.1.1	$7! = 5\,040$	✓✓ answer (2)
10.1.2	$4! \times 4!$ $= 576$ $P(\text{African flags together}) = \frac{576}{5040} \left(= \frac{4}{35} = 0,11 \right)$	✓ $4!$ ✓ $4! \times 4!$ ✓ answer (A) (3)
10.2	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $0,88 = 0,4 + P(B) - P(A \text{ and } B)$ $0,88 = 0,4 + P(B) - 0,4P(B)$ $0,48 = 0,6P(B)$ $P(B) = 0,8$	✓ subs into rule ✓ $P(A \text{ and } B) = 0,4P(B)$ ✓ answer (3)
10.3	First Passenger Second Passenger Probability of first passenger choosing meat = $\frac{x}{120}$ Probability of second passenger choosing cheese = $\frac{120-x}{119}$ $\frac{x}{120} \times \frac{120-x}{119} = \frac{18}{85}$ $120x - x^2 = 3\,024$ $x^2 - 120x + 3\,024 = 0$ $(x-84)(x-36) = 0$ $x = 84 \quad \text{or} \quad x = 36$ $\therefore P(1^{\text{st}} \text{ cheese}) = \frac{36}{120} = \frac{3}{10}$	✓ $\frac{x}{120}$ ✓ $\frac{120-x}{119}$ ✓ $\frac{x}{120} \times \frac{120-x}{119} = \frac{18}{85}$ ✓ $x = 84 \quad \text{or} \quad x = 36$ ✓ $\frac{3}{10}$ (5)
		[13]

TOTAL/TOTAAL: 150