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EASTERN CAPE
EDUCATION

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ERRATA

TO: **PRINCIPALS OF GRADE 12 SCHOOLS**
SUBJECT ADVISORS

FROM: **CES: INSTRUMENT DEVELOPMENT UNIT**
MS N. MBELEKI

DATE: **29 AUGUST 2019**

SUBJECT: **GRADE 12 MATHEMATICS PAPER 1 ERRATA**

1. The Grade 12 Mathematics Paper 1 was written on Friday, 23 August 2019. The Directorate received reports from some schools and relevant stakeholders about some challenges experienced during the writing of Grade 12 Mathematics question paper.
2. In order to address these challenges, the following standardised approach to marking should be adopted across the Province:

The word “repetition” and the fact that the word contains 2 x “R’s” contributed to the ***ambiguity*** of this question.

Below are solutions that may be considered for this examination ONLY.

QUESTION 11.2

11.2 Consider the letters of the word: NUMERATOR.

11.2.1 How many 9 letter word-arrangements can be formed, if repetition of letters is allowed? (1)

11.2.2 How many 9 letter word-arrangements can be formed, if all 4 vowels are never together and repetition of letters is not allowed? (3)

11.2.3 An 8 letter word-arrangement is made from the word NUMERATOR. All the vowels must be included in this word-arrangement and repetition of letters is not allowed. What is the probability that all odd-number spaces are occupied by vowels? (4)

[15]

ORIGINAL MARKING GUIDELINE

11.2.1	9^9 or / *of* $387\,420\,489$	✓ 9^9 (1)
11.2.2	If vowels are together/*As die vokale saam is*: $6! \times 4!$ $\therefore$ If vowels are not all together: *As die vokale nie almal saam is nie* : $9! - (6! \times 4!)$ $= 345\,600$	✓ $6! \times 4!$ ✓ subtracting from $9!$ *aftrekking vanaf 9!* ✓ answer / *antwoord* (3)
11.2.3	*Vowels in odd spaces* : $= \mathbf{4} \times 5 \times \mathbf{3} \times 4 \times \mathbf{2} \times 3 \times \mathbf{1} \times 2$ $= (\mathbf{4} \times \mathbf{3} \times \mathbf{2} \times \mathbf{1}) \times (5 \times 4 \times 3 \times 2)$ $= 4! \times 120$ $= 2880$ $\therefore \textit{Probability} = \frac{2880}{(9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2)}$ $= \frac{2880}{362\,880}$ $= \frac{1}{126}$	✓ $4!$ ✓ $\times 120$ ✓ $\frac{\text{Vowels in odd spaces}}{(9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2)}$ / $\frac{\textit{Vokale in onewe spasies}}{(9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2)}$ ✓ answer / *antwoord* (4) **[15]**

CORRECTION TO MARKING GUIDELINE

11.2.1	Since there are only 8 distinct letters the answer should be: *Omdat daar slegs 8 unieke letters is, is die antwoord:* 8^9 or / *of* $134\,217\,728$	✓ 8^9 (1)
11.2.2	If vowels are together/*As die vokale saam is*: $\frac{6!}{2!}\times 4!$ $\therefore$ If vowels are not all together: *As die vokale nie almal saam is nie* : $\frac{9!}{2!}-\left(\frac{6!}{2!}\times 4!\right)$ $=172\,800$ **OR/*OF*** The ambiguity might lead to the understanding that there are only 8 distinct letters but the word must contain 9 letters. **NO SOLUTION / GEEN OPLOSSING**	✓ $\frac{6!}{2!}\times 4!$ ✓ subtracting from $\frac{9!}{2!}$ *aftrekking vanaf* $\frac{9!}{2!}$ ✓ answer / *antwoord* (3)
11.2.3	Since there are only 4 distinct consonants:	

	Omdat daar slegs 4 unieke konsonante is: *Vowels in odd spaces*: $= \mathbf{4} \times 4 \times \mathbf{3} \times 3 \times \mathbf{2} \times 2 \times \mathbf{1} \times 1$ $= (\mathbf{4} \times \mathbf{3} \times \mathbf{2} \times \mathbf{1}) \times (4 \times 3 \times 2 \times 1)$ $= 4! \times 4!$ $= 576$ $\therefore Probability = \dfrac{576}{(8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1)}$ $= \dfrac{576}{40\,320}$ $= \dfrac{1}{70}$	✓ $4! \times 4!$ ✓ $\dfrac{\text{Vowels in odd spaces}}{(8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1)}$ / $\dfrac{\textit{Vokale in onewe spasies}}{(8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1)}$ ✓ answer / *antwoord* (4) **[15]**

After considering the impact of the ambiguity of the question, schools are informed not to mark this sub-question 11.2 and mark out of 142.

Yours in Quality Education

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CES: INSTRUMENT DEVELOPMENT UNIT **DATE**
MS N. MBELEKI

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Ikamva eliqaqambileyo!