#

**SEAT CALCULATION IN TERMS OF SCHEDULE 1A**

**7 October 2022**

#

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2. **Conception of Proportionality**
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**SEAT CALCULATION IN TERMS OF SCHEDULE 1A**

# Section 46 and 105 of the Constitution provide the normative standards of an electoral system which is that an election must result *“in general, in proportional representation”*.

1. Studies to electoral systems generally agree that perfect proportionality, meaning an electoral system where each party receives exactly the same share of seats as it received of the votes, is unattainable.
2. It logically follows that some deviation from perfect proportionality (i.e., disproportionality) is unavoidable. Presumably, this is the reason why the drafters of the Constitution used the phrase “in general, in proportional representation”, when specifying the electoral system.
3. Proportionality is a function of primarily three factors:
	1. **Electoral threshold**: Refers to the minimum share of votes, in percentage, that a party or candidate must win to obtain a seat in parliament.
	2. **The district magnitude**: The number of candidates to be elected in an electoral district.
	3. **The electoral formula**: Is the mathematical equation that determines how votes are translated into parliamentary seats.
4. Overall, the proportionality of an electoral system increases with:
	1. Decreases in the electoral threshold;
	2. Increases in the average district magnitude; and
	3. Improvements in the proportionality of the electoral formula.
5. Across all three factors, South Africa’s electoral system is ranked among the most proportional in the world. There is no electoral threshold, meaning that relatively few votes are wasted.
6. Schedule 1A sets out the electoral system. It provides that the 400 seats of the national assembly will be contested on the bases of 200 national compensatory seats and 200 regional seats. The Commission is empowered to proportionally determine the regional allocation of regional seats.
7. Droop is used as a method of determining the quota of votes required to obtain a seat. This is so because Droop is considered one of the most proportionate formulas.
8. Independents may only be elected to a single seat. As a consequence there is seat forfeiture and recalculation method to award surplus seats.
9. A submission from Mr. Atkins asserted that the seat allocation formula distorts proportionality.

10.1. The assertions are based on extreme cases that also contain errors that may exaggerate the claimed effects.

10.2. The probability and magnitude of the distortions are not known even to Mr Atkins.

1. The probability of the distortions happening can only be tested using the Monte Carlo simulation. This entails:
	1. Writing a software programme
	2. Running repeated random sampling to obtain numeric results.
	3. Analysing the probability

**Electoral Amendment Bill - Regional Calculation Scenario with Independent gaining more than one seat during elections**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Gauteng** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Party** | **Valid Votes** | **Votes/Quota** | **First Allocation** | **Remainder** | **Rank** | **Final Allocation** |  |
| Party 1 | 36 249 | 0,391453656 | 0 | 36 249 |   | 0 |  |
| Party 2 | 918 | 0,0099135 | 0 | 918 |   | 0 |  |
| Party 3 | 1 174 | 0,012678049 | 0 | 1 174 |   | 0 |  |
| Party 4 | 2 782 | 0,030042872 | 0 | 2 782 |   | 0 |  |
| Party 5 | 992 | 0,010712627 | 0 | 992 |   | 0 |  |
| Party 6 | 9 715 | 0,104912474 | 0 | 9 715 |   | 0 |  |
| Party 7 | 2 413 979 | 26,06860617 | 26 | 6 353 |   | 26 |  |
| Party 8 | 3 136 | 0,033865725 | 0 | 3 136 |   | 0 |  |
| Party 9 | 900 | 0,009719118 | 0 | 900 |   | 0 |  |
| Party 10 | 4 225 | 0,045625857 | 0 | 4 225 |   | 0 |  |
| Party 11 | 9 948 | 0,107428645 | 0 | 9 948 |   | 0 |  |
| Party 12 | 2 486 | 0,026846362 | 0 | 2 486 |   | 0 |  |
| Party 13 | 2 579 | 0,027850671 | 0 | 2 579 |   | 0 |  |
| Party 14 | 7 064 | 0,076284273 | 0 | 7 064 |   | 0 |  |
| Party 15 | 1 345 | 0,014524681 | 0 | 1 345 |   | 0 |  |
| Party 16 | 3 842 | 0,041489833 | 0 | 3 842 |   | 0 |  |
| Party 17 | 565 | 0,006101446 | 0 | 565 |   | 0 |  |
| Party 18 | 7 009 | 0,075690327 | 0 | 7 009 |   | 0 |  |
| Party 19 | 7 515 | 0,081154631 | 0 | 7 515 |   | 0 |  |
| Party 20 | 1 248 | 0,013477176 | 0 | 1 248 |   | 0 |  |
| Party 21 | 361 | 0,003898446 | 0 | 361 |   | 0 |  |
| Party 22 | 12 358 | 0,133454282 | 0 | 12 358 |   | 0 |  |
| Party 23 | 1 112 990 | 12,01920066 | 12 | 1 778 |   | 12 |  |
| Party 24 | 854 | 0,009222363 | 0 | 854 |   | 0 |  |
| Party 25 | 1 398 | 0,015097029 | 0 | 1 398 |   | 0 |  |
| Party 26 | 613 704 | 6,627401432 | 6 | 58 098 | 2 | 7 |  |
| Party 27 | 729 | 0,007872485 | 0 | 729 |   | 0 |  |
| Party 28 | 781 | 0,008434034 | 0 | 781 |   | 0 |  |
| Party 29 | 2 737 | 0,029556916 | 0 | 2 737 |   | 0 |  |
| Party 30 | 9 983 | 0,107806611 | 0 | 9 983 |   | 0 |  |
| Party 31 | 1 191 | 0,012861632 | 0 | 1 191 |   | 0 |  |
| Party 32 | 684 | 0,007386529 | 0 | 684 |   | 0 |  |
| Party 33 | 452 | 0,004881157 | 0 | 452 |   | 0 |  |
| Party 34 | 1 154 | 0,012462068 | 0 | 1 154 |   | 0 |  |
| Party 35 | 3 568 | 0,038530901 | 0 | 3 568 |   | 0 |  |
| Party 36 | 197 | 0,002127407 | 0 | 197 |   | 0 |  |
| Party 37 | 1 091 | 0,01178173 | 0 | 1 091 |   | 0 |  |
| Party 38 | 10 842 | 0,117082969 | 0 | 10 842 |   | 0 |  |
| Party 39 | 1 206 | 0,013023617 | 0 | 1 206 |   | 0 |  |
| Party 40 | 163 | 0,00176024 | 0 | 163 |   | 0 |  |
| Party 41 | 429 | 0,004632779 | 0 | 429 |   | 0 |  |
| Independent 1 | 5 903 | 0,063746612 | 0 | 5 903 |   | 0 |  |
| Independent 2 | 138 | 0,001490265 | 0 | 138 |   | 0 |  |
| Independent 3 | 419 | 0,004524789 | 0 | 419 |   | 0 |  |
| Independent 4 | 13 160 | 0,142115096 | 0 | 13 160 |   | 0 |  |
| Independent 5 | 175 152 | 1,891469855 | 1 | 82 551 | 1 | 2 | \* Recalculation required |
| Independent 6 | 2 247 | 0,024265397 | 0 | 2 247 |   | 0 |  |
| Independent 7 | 45 840 | 0,495027052 | 0 | 45 840 | 3 | 1 |  |
|   | **4 537 402** |   | **45** |   |   | **48** |  |
|  |  |  |  |  |  |  |  |
| **QUOTA** | 92601,04082 |  |  |  |  |  |  |
|  | **92601** |  |  |  |  |  |  |
| **SEATS** | **48** |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Forfeiture calculation as result of Independent 5 gaining more than 1 seat** |  |
|  |  |  |  |  |  |  |  |
| **Party** | **Valid Votes** | **Votes/Quota** | **First Allocation** | **Remainder** | **Rank** | **Final Allocation** |  |
| Party 1 | 36 249 | 0,411494931 | 0 | 36 249 |   | 0 |  |
| Party 2 | 918 | 0,010421042 | 0 | 918 |   | 0 |  |
| Party 3 | 1 174 | 0,013327128 | 0 | 1 174 |   | 0 |  |
| Party 4 | 2 782 | 0,031580979 | 0 | 2 782 |   | 0 |  |
| Party 5 | 992 | 0,011261082 | 0 | 992 |   | 0 |  |
| Party 6 | 9 715 | 0,110283684 | 0 | 9 715 |   | 0 |  |
| Party 7 | 2 413 979 | 27,4032421 | 27 | 35 522 |   | 27 | \* Additional seat gained by party 7 |
| Party 8 | 3 136 | 0,03559955 | 0 | 3 136 |   | 0 |  |
| Party 9 | 900 | 0,010216708 | 0 | 900 |   | 0 |  |
| Party 10 | 4 225 | 0,047961767 | 0 | 4 225 |   | 0 |  |
| Party 11 | 9 948 | 0,112928676 | 0 | 9 948 |   | 0 |  |
| Party 12 | 2 486 | 0,028220817 | 0 | 2 486 |   | 0 |  |
| Party 13 | 2 579 | 0,029276544 | 0 | 2 579 |   | 0 |  |
| Party 14 | 7 064 | 0,080189804 | 0 | 7 064 |   | 0 |  |
| Party 15 | 1 345 | 0,015268302 | 0 | 1 345 |   | 0 |  |
| Party 16 | 3 842 | 0,04361399 | 0 | 3 842 |   | 0 |  |
| Party 17 | 565 | 0,006413822 | 0 | 565 |   | 0 |  |
| Party 18 | 7 009 | 0,079565449 | 0 | 7 009 |   | 0 |  |
| Party 19 | 7 515 | 0,085309509 | 0 | 7 515 |   | 0 |  |
| Party 20 | 1 248 | 0,014167168 | 0 | 1 248 |   | 0 |  |
| Party 21 | 361 | 0,004098035 | 0 | 361 |   | 0 |  |
| Party 22 | 12 358 | 0,140286749 | 0 | 12 358 |   | 0 |  |
| Party 23 | 1 112 990 | 12,63454836 | 12 | 55 898 |   | 12 | \* Seats for the party remains the same where in the proposed changes they would have gained a seat |
| Party 24 | 854 | 0,00969452 | 0 | 854 |   | 0 |  |
| Party 25 | 1 398 | 0,015869953 | 0 | 1 398 |   | 0 |  |
| Party 26 | 613 704 | 6,966704885 | 6 | 85 158 | 1 | 7 |  |
| Party 27 | 729 | 0,008275533 | 0 | 729 |   | 0 |  |
| Party 28 | 781 | 0,008865832 | 0 | 781 |   | 0 |  |
| Party 29 | 2 737 | 0,031070143 | 0 | 2 737 |   | 0 |  |
| Party 30 | 9 983 | 0,113325992 | 0 | 9 983 |   | 0 |  |
| Party 31 | 1 191 | 0,01352011 | 0 | 1 191 |   | 0 |  |
| Party 32 | 684 | 0,007764698 | 0 | 684 |   | 0 |  |
| Party 33 | 452 | 0,005131058 | 0 | 452 |   | 0 |  |
| Party 34 | 1 154 | 0,01310009 | 0 | 1 154 |   | 0 |  |
| Party 35 | 3 568 | 0,04050357 | 0 | 3 568 |   | 0 |  |
| Party 36 | 197 | 0,002236324 | 0 | 197 |   | 0 |  |
| Party 37 | 1 091 | 0,01238492 | 0 | 1 091 |   | 0 |  |
| Party 38 | 10 842 | 0,123077272 | 0 | 10 842 |   | 0 |  |
| Party 39 | 1 206 | 0,013690388 | 0 | 1 206 |   | 0 |  |
| Party 40 | 163 | 0,001850359 | 0 | 163 |   | 0 |  |
| Party 41 | 429 | 0,004869964 | 0 | 429 |   | 0 |  |
| Independent 1 | 5 903 | 0,067010251 | 0 | 5 903 |   | 0 |  |
| Independent 2 | 138 | 0,001566562 | 0 | 138 |   | 0 |  |
| Independent 3 | 419 | 0,004756445 | 0 | 419 |   | 0 |  |
| Independent 4 | 13 160 | 0,149390971 | 0 | 13 160 |   | 0 |  |
| Independent 5 |   |   |   |   |   | 1 |  |
| Independent 6 | 2 247 | 0,025507714 | 0 | 2 247 |   | 0 |  |
| Independent 7 |   |   |   |   |   | 1 | \* In terms of the current drafting, Independent 7 will be excluded from the calculations, and retains the seat.The effect may be exacerbated by other Independents with 1 seat. |
|   | **4 316 410** |   | **45** |   |   | **48** |  |
|  |  |  |  |  |  |  |  |
| **QUOTA** | 88091 |  |  |  |  |  |  |
|  | **88091** |  |  |  |  |  |  |
| **SEATS** | **48** |  |  |  |  |  |  |



**Electoral Amendment Bill - Provincial Calculation Scenario with vacancy occurring during the term**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **WESTERN CAPE** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Party** | **Valid Votes** | **Votes/Quota** | **First Allocation** | **Remainder** | **Rank** | **Final Seat Allocation** |  |
| Party 1 | 54 762 | 1,144619 | 1 | 6 919 |   | 1 |  |
| Party 2 | 257 | 0,005372 | 0 | 257 |   | 0 |  |
| Party 3 | 993 | 0,020755 | 0 | 993 |   | 0 |  |
| Party 4 | 2 898 | 0,060573 | 0 | 2 898 |   | 0 |  |
| Party 5 | 589 055 | 12,312250 | 12 | 14 939 |   | 12 |  |
| Party 6 | 915 | 0,019125 | 0 | 915 |   | 0 |  |
| Party 7 | 531 | 0,011099 | 0 | 531 |   | 0 |  |
| Party 8 | 4 953 | 0,103526 | 0 | 4 953 |   | 0 |  |
| Party 9 | 17 607 | 0,368016 | 0 | 17 607 | 4 | 1 |  |
| Party 10 | 556 | 0,011621 | 0 | 556 |   | 0 |  |
| Party 11 | 6 175 | 0,129068 | 0 | 6 175 |   | 0 |  |
| Party 12 | 475 | 0,009928 | 0 | 475 |   | 0 |  |
| Party 13 | 9 331 | 0,195034 | 0 | 9 331 |   | 0 |  |
| Party 14 | 6 528 | 0,136446 | 0 | 6 528 |   | 0 |  |
| Party 15 | 1 140 647 | 23,841461 | 23 | 40 258 | 1 | 24 |  |
| Party 16 | 1 703 | 0,035596 | 0 | 1 703 |   | 0 |  |
| Party 17 | 83 075 | 1,736409 | 1 | 35 232 | 2 | 2 |  |
| Party 18 | 310 | 0,006480 | 0 | 310 |   | 0 |  |
| Party 19 | 470 | 0,009824 | 0 | 470 |   | 0 |  |
| Party 20 | 61 971 | 1,295299 | 1 | 14 128 |   | 1 |  |
| Party 21 | 9 536 | 0,199319 | 0 | 9 536 |   | 0 |  |
| Party 22 | 599 | 0,012520 | 0 | 599 |   | 0 |  |
| Party 23 | 1 512 | 0,031603 | 0 | 1 512 |   | 0 |  |
| Party 24 | 1 854 | 0,038752 | 0 | 1 854 |   | 0 |  |
| Party 25 | 5 926 | 0,123863 | 0 | 5 926 |   | 0 |  |
| Party 26 | 2 240 | 0,046820 | 0 | 2 240 |   | 0 |  |
| Party 27 | 444 | 0,009280 | 0 | 444 |   | 0 |  |
| Party 28 | 3 845 | 0,080367 | 0 | 3 845 |   | 0 |  |
| Party 29 | 710 | 0,014840 | 0 | 710 |   | 0 |  |
| Independent 1 | 3 852 | 0,080513 | 0 | 3 852 |   | 0 |  |
| Independent 2 | 3 026 | 0,063249 | 0 | 3 026 |   | 0 |  |
| Independent 3 | 2 613 | 0,054616 | 0 | 2 613 |   | 0 |  |
| Independent 4 | 5 728 | 0,119725 | 0 | 5 728 |   | 0 |  |
| Independent 5 | 32 115 | 0,671258 | 0 | 32 115 | 3 | 1 | \* Vacancy |
|   | **2 057 212** |   | **38** |   |   | **42** |  |
|  |  |  |  |  |  |  |  |
| **QUOTA** | 47843,13953 |  |  |  |  |  |  |
|  | **47 843** |  |  |  |  |  |  |
| **SEATS** | **42** |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Vacancy calculation** |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Party** | **Valid Votes** | **Votes/Quota** | **First Allocation** | **Remainder** | **Rank** | **Final Seat Allocation** |  |
| Party 1 | 54 762 | 1,162774 | 1 | 7 666 |   | 1 |  |
| Party 2 | 257 | 0,005457 | 0 | 257 |   | 0 |  |
| Party 3 | 993 | 0,021085 | 0 | 993 |   | 0 |  |
| Party 4 | 2 898 | 0,061534 | 0 | 2 898 |   | 0 |  |
| Party 5 | 589 055 | 12,507538 | 12 | 23 903 | 2 | 13 | \* Party 5 gains the additional seat |
| Party 6 | 915 | 0,019428 | 0 | 915 |   | 0 |  |
| Party 7 | 531 | 0,011275 | 0 | 531 |   | 0 |  |
| Party 8 | 4 953 | 0,105168 | 0 | 4 953 |   | 0 |  |
| Party 9 | 17 607 | 0,373853 | 0 | 17 607 | 3 | 1 | **\* Note** that party 9, which gained a seat with far less than the quota, retains the seat. |
| Party 10 | 556 | 0,011806 | 0 | 556 |   | 0 |  |
| Party 11 | 6 175 | 0,131115 | 0 | 6 175 |   | 0 |  |
| Party 12 | 475 | 0,010086 | 0 | 475 |   | 0 |  |
| Party 13 | 9 331 | 0,198127 | 0 | 9 331 |   | 0 |  |
| Party 14 | 6 528 | 0,138610 | 0 | 6 528 |   | 0 |  |
| Party 15 | 1 140 647 | 24,219615 | 24 | 10 343 |   | 24 |  |
| Party 16 | 1 703 | 0,036160 | 0 | 1 703 |   | 0 |  |
| Party 17 | 83 075 | 1,763950 | 1 | 35 979 | 1 | 2 |  |
| Party 18 | 310 | 0,006582 | 0 | 310 |   | 0 |  |
| Party 19 | 470 | 0,009980 | 0 | 470 |   | 0 |  |
| Party 20 | 61 971 | 1,315844 | 1 | 14 875 |   | 1 |  |
| Party 21 | 9 536 | 0,202480 | 0 | 9 536 |   | 0 |  |
| Party 22 | 599 | 0,012719 | 0 | 599 |   | 0 |  |
| Party 23 | 1 512 | 0,032105 | 0 | 1 512 |   | 0 |  |
| Party 24 | 1 854 | 0,039366 | 0 | 1 854 |   | 0 |  |
| Party 25 | 5 926 | 0,125828 | 0 | 5 926 |   | 0 |  |
| Party 26 | 2 240 | 0,047562 | 0 | 2 240 |   | 0 |  |
| Party 27 | 444 | 0,009428 | 0 | 444 |   | 0 |  |
| Party 28 | 3 845 | 0,081642 | 0 | 3 845 |   | 0 |  |
| Party 29 | 710 | 0,015076 | 0 | 710 |   | 0 |  |
| Independent 1 | 3 852 | 0,081790 | 0 | 3 852 |   | 0 |  |
| Independent 2 | 3 026 | 0,064252 | 0 | 3 026 |   | 0 |  |
| Independent 3 | 2 613 | 0,055482 | 0 | 2 613 |   | 0 |  |
| Independent 4 | 5 728 | 0,121624 | 0 | 5 728 |   | 0 |  |
| Independent 5 |   |   |   |   |   | 0 |  |
|   | **2 025 097** |   | **39** |   |   | **42** |  |
|  |  |  |  |  |  |  |  |
| **QUOTA** | 47096,27907 |  |  |  |  |  |  |
|  | **47 096** |  |  |  |  |  |  |
| **SEATS** | **42** |  |  |  |  |  |  |

