



© 1997–2009, Millennium Mathematics Project, University of Cambridge.

Permission is granted to print and copy this page on paper for non-commercial use. For other uses, including electronic redistribution, please contact us.

May 2004

Regulars



## Relationships: solution

Here is the table of decisions after Dell and Tracy have added their "No's":

	Decorate house?	Tidy garden?	Buy TV?
<b>Ali</b>	Yes	Yes	No
<b>Bob</b>	No	Yes	Yes
<b>Carla</b>	Yes	No	Yes
<b>Old Majority decision</b>	YES	YES	YES
<b>Dell</b>	No	No	No
<b>Tracy</b>	No	No	No
<b>Overall decision</b>	NO	NO	NO



An untidy garden? What a paradox!

## Plus Magazine

We see that their negative votes have tipped the scales on each question. Now there is a majority of 3 to 2 not to decorate the house, not to tidy the garden, and not to buy a TV. But more striking is the fact that a majority (each of Ali, Bob, and Carla) are on the losing side of the vote on two of the three issues. These are the issues on which they don't vote "No". So Ali is on the losing side over the house and garden, Bob on the losing side over the garden and TV, and Carla is on the losing side over the house and the TV. Hence a majority of the people (three out of five) were on the losing side on a majority of the issues (two out of three)! This is called the *Anscombe Paradox*.

## Further reading

- G.E.M. Anscombe, On the frustration of the majority by fulfillment of the majority's will, *Analysis* 36, 161–8 (1976).
- D.G. Saari, *Decisions and Elections: explaining the unexplained*, Cambridge University Press (2001).
- *For All Practical Purposes: Mathematical Literacy in Today's World, fifth edition* by the COMAP collaboration, W.H. Freeman, (2000), see chapters on voting and elections. This book is especially recommended; see the [review](#) in issue 13 of *Plus*.

---

[Back to Outer space: A sense of proportion](#)

---



*Plus* is part of the family of activities in the Millennium Mathematics Project, which also includes the [NRICH](#) and [MOTIVATE](#) sites.