

# Cal Poly Department of Mathematics

## Puzzle of the Week

Feb 19-25, 2010

Fred and Wilma host a dinner party with 4 other couples invited. Each person shakes hands with every other person which he or she has not met. Late in the evening Wilma asks everyone how many people he or she shook hands with and to her surprise each person gives a different answer. How many people did Fred shake hands with?

*Solutions should be submitted to Morgan Sherman:*

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*before next Friday. Those with correct and complete solutions will have their names listed in next week's email announcement. Anybody is welcome to make a submission.*

### *Solution:*

Fred shook hands with 4 people.

First notice that Fred could not have shaken hands with 8 people since there is one person who shook hands with nobody. Therefore consider the person, call him Albert, who shook hands with 8 people. As Albert did not shake hands with his partner, nor with himself, Albert must have shaken hands with every other person at the party. This means the person who shook 0 hands must be Albert's partner.

Now remove Albert and his partner and apply the same reasoning with the person who shook 7 hands. Their partner must be the one who shook hands with 1 person. Similarly 6 and 2 must also be a couple, as well as 5 and 3. That leaves only the number 4 for Fred (and in fact also Wilma).