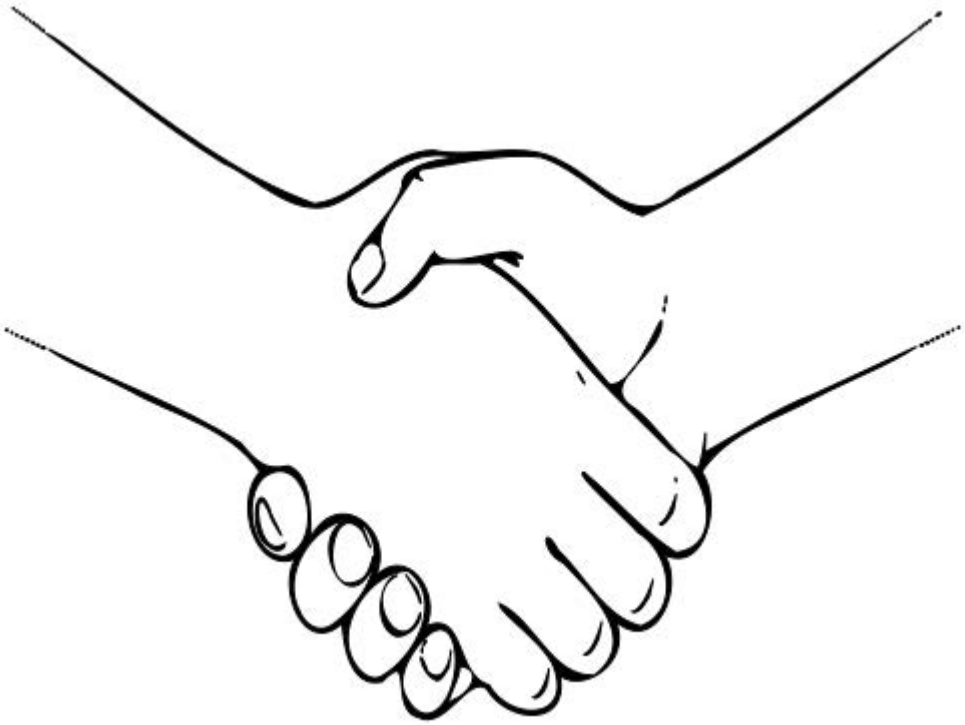
Puzzle of the Week

Handshakes at a Party – Couples

There were four married couples at a party. A lot of handshakes took place. No one shook the hand of their spouse. One person, Sam, was surprised when Sam asked the seven other people how many handshakes they made - the seven handshake counts were different!

THE CHALLENGE: How is this possible, and how many handshakes did Sam's spouse make?



Puzzle of the Week
Handshakes at a Party – Couples – Notes

THE CHALLENGE: No one shook their own hand, and if they didn't shake their spouse's hand, then the maximum count for any person was six. If the seven counts were different, then they must exactly be the whole list of numbers from 0 to 6.

Consider the person with six handshakes. They shook everyone's hand except their spouse. Put another way, we know everyone other than that person's spouse had at least one handshake. Therefore, the person with 0 handshakes had to be married to the person with six handshakes!

If you remove this couple and the handshakes they were involved in, you are left with three married couples, and each of these six people will have their handshake count reduced by one. We now have a new problem very similar to the original one. These three couples will have handshake counts that are exactly the list of numbers from 0 to 4 (not listing Sam's count). For the same reasons as before, we can be sure that the person with four handshakes on this list (five handshakes originally) is married to the person with zero handshakes on this list (one handshake originally).

Carrying out this logic one more time, we come to the conclusion that 6 and 0 are married, 5 and 1 are married, and 4 and 2 are married. The only remaining person had 3 handshakes, and they must be married to Sam!

By the way, Sam had three handshakes as well (Sam shook hands with 4, 5, and 6).