

Transitive Property: Solution

We may outline all (equally likely) outcomes:

●	2	4	9
1	●	●	●
6	●	●	●
8	●	●	●

●	3	5	7
2	●	●	●
4	●	●	●
9	●	●	●

●	1	6	8
3	●	●	●
5	●	●	●
7	●	●	●

The dots represent winners. The upper left dot represents the die which is more likely to win between the two dice in a given table. Therefore,

$$\text{Prob}(L > C) = \text{Prob}(M > L) = \text{Prob}(C > M) = \frac{5}{9}.$$

In other words, lime beats cyan, magenta beats lime, and cyan beats magenta.

Thus, whatever die you pick, your acquaintance may pick the superior die and have the better odds, so you should not accept the offer.