

Maths Circle India

TIFR-STCS Maths Circle Team

Session 4: June 3, 2022

1 Frenemies

Zoya is inviting some of her classmates over for a summer party. She has prepared a menu of cut fruits and coconut water. But she hasn't yet decided how many people to invite. There is one thing she wants to ensure. One of the tables in her house seats three people. She wants to ensure that one of the following things happens: either all three people sitting on the special table are friends with each other, or none of the three of them know any of the other two. Zoya can't sit at the table herself.

Zoya doesn't know which of her classmates are friends with each other. How many people must she invite to guarantee that she will find 3 people who are all friends, or all strangers?

(Assume that if A is friends with B, then B is also friends with A.)