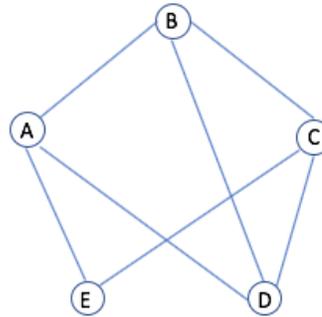
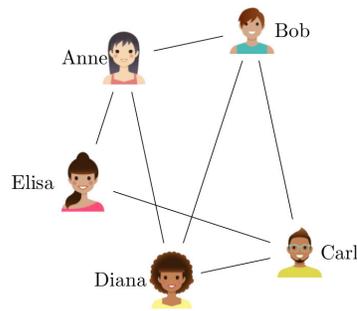


Mathletes Problem of the Week #12

Friendship Graphs



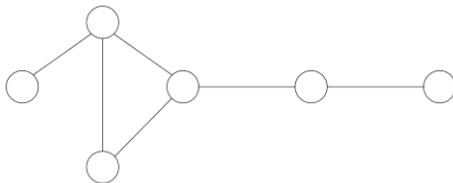
We can represent a group of friends and the friendships between them by drawing what is called a graph. Each circle represents a person. An edge joins two circles if and only if those two people are friends. In the picture above, there are five people: Anne, Bob, Carl, and Diana each have 3 friends in the group, and Elisa has 2 friends.

a) Let's imagine the friends above have different friendships. *(There are some circles on the back for you to use!)*

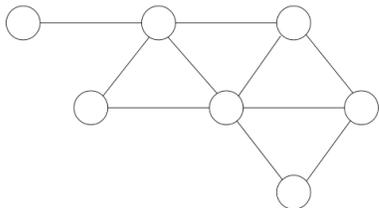
What if Anne has only one friend in the group, Bob has two friends in the group, Carl has three friends in the group, and Elisa is friends with everyone in the group. How many friends does Diana have? How do you know?

What if Anne has only one friend in the group, Bob and Carl both have two friends in the group, and Elisa is friends with everyone in the group. How many friends does Diana have now? How do you know?

b) Use the clues below to figure out who is who in each of these friendship graphs.



1. Alan has 3 friends, Barney, Charlie, and Daniel.
2. Barney and Ed are both friends with Charlie.
3. Ed is Frank's only friend.



1. Bella and Ciara are friends
2. Emily and Ciara are not friends
3. Bella is Fiona's only friend
4. Anna has more friends than anyone else
5. Daphne has three friends
6. Gill and Daphne are not friends
7. Emily has two friends

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Solutions & Explanations: (Try one or try them all! Record your solutions and explanations above and on the back. Attach more paper if you need to.)

Name _____ Class _____

(First and last name, please!)

Solutions due: March 12th

