



Emory Math Circle

**You are given \$10 in a convenience store.
What do you buy?**

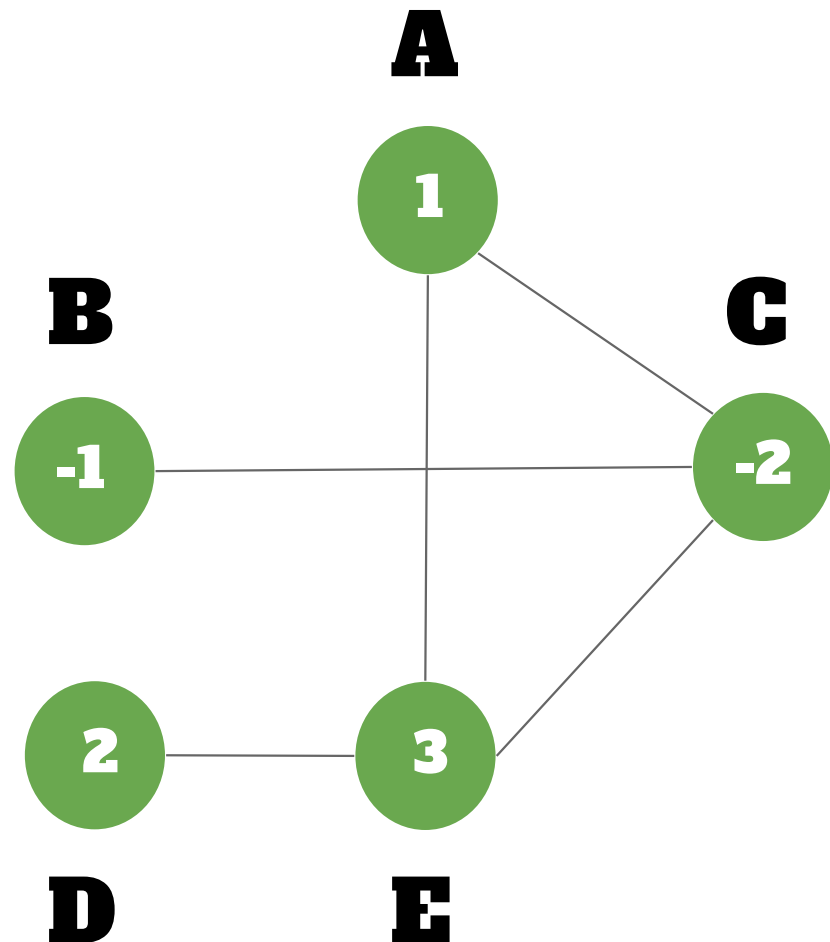
The Dollar Game

The Dollar Game

Each green dot represents a person

Each line between them is a connection

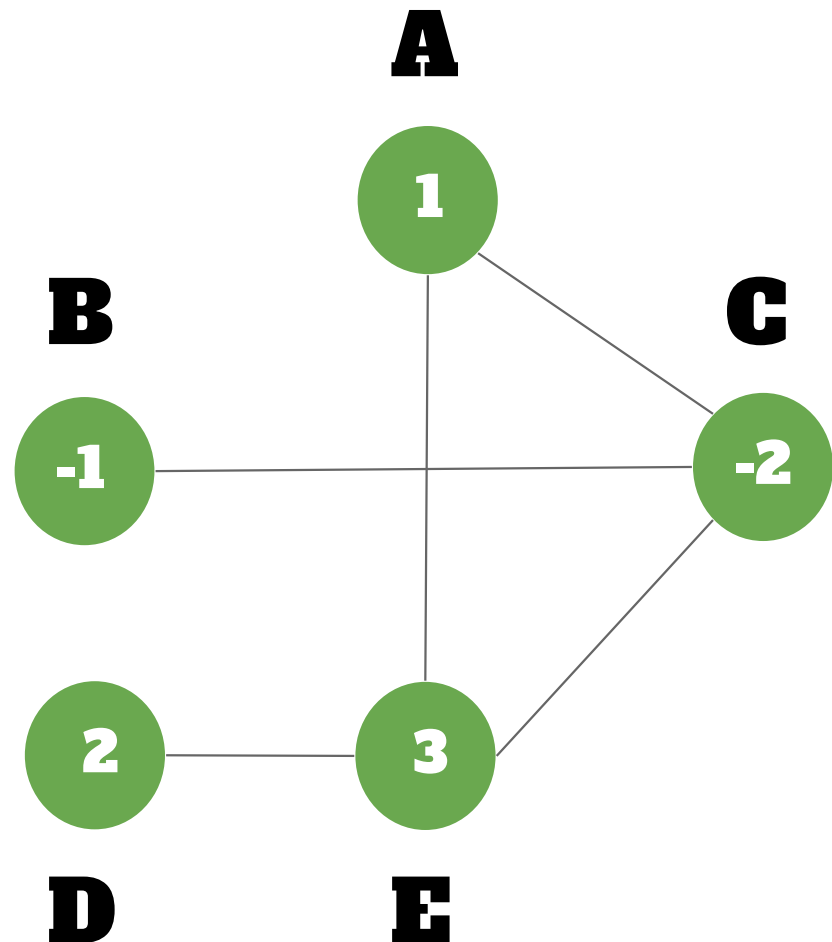
The number in the dot represents how much money they have



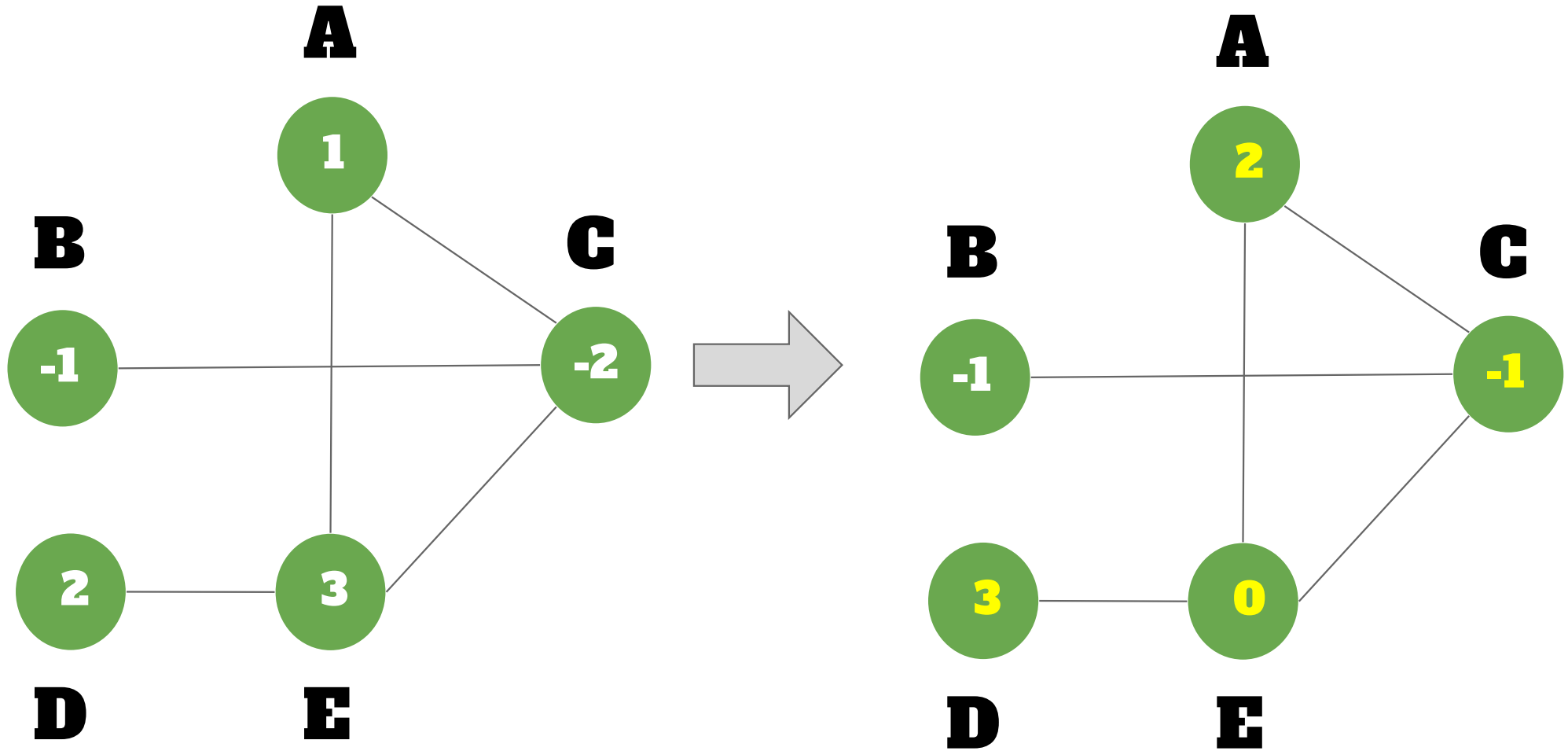
The Dollar Game

There are two possible moves:

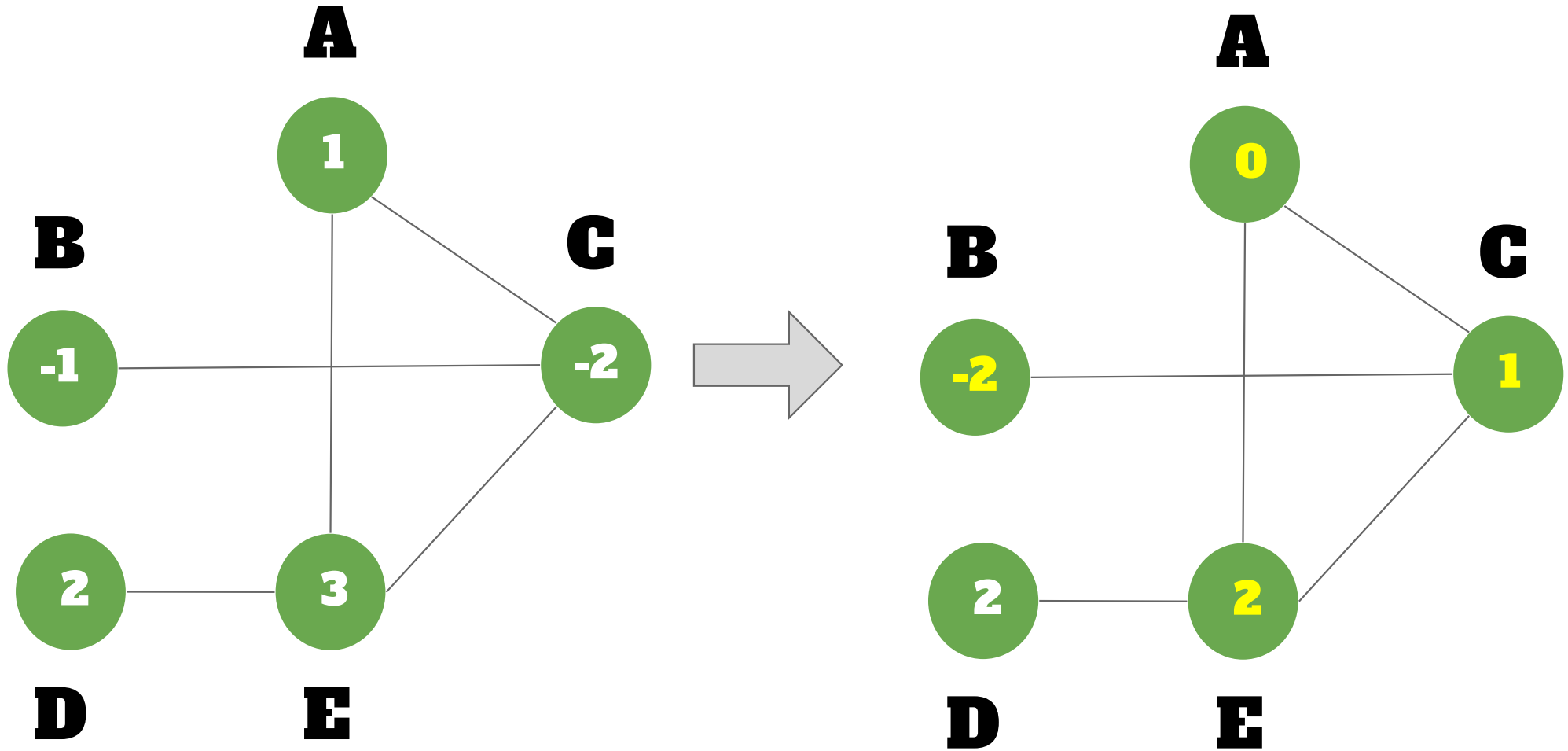
1. A person can donate \$1 to every dot they are connected to
2. A person can borrow \$1 from every dot they are connected to



For example: E chooses to donate



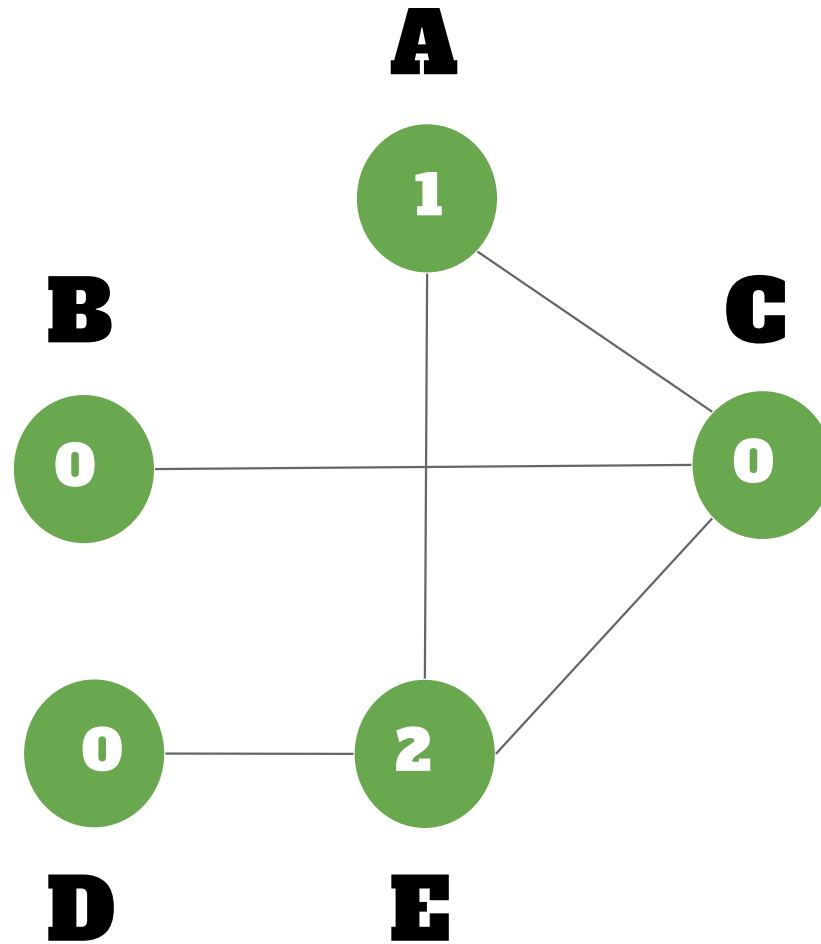
For example: C chooses to borrow



**Goal: Get
everyone out of
debt!**

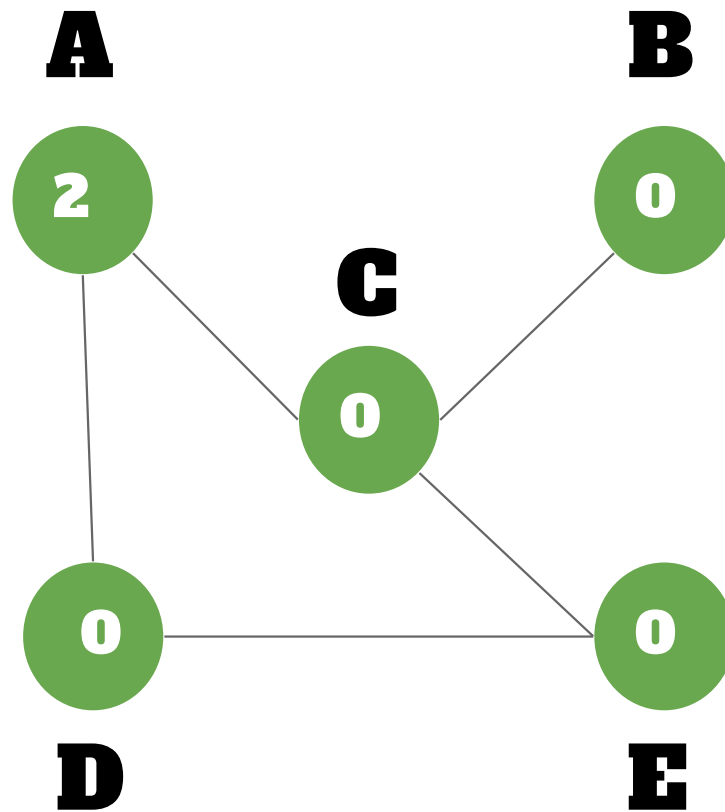
i.e., get every person to have 0
dollars or more

Can we achieve our goal?

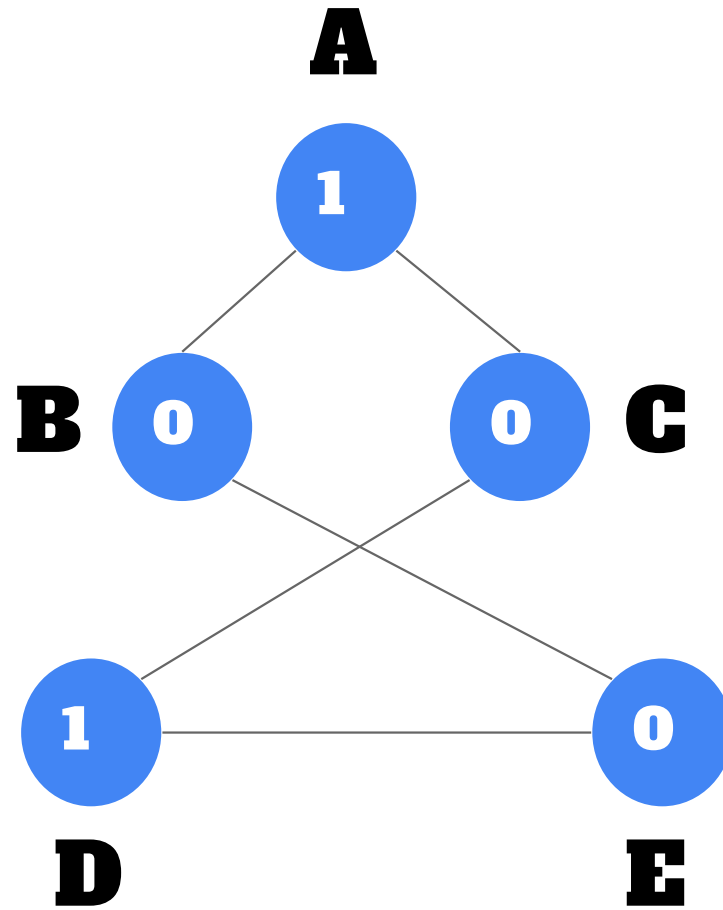


Breakout Rooms

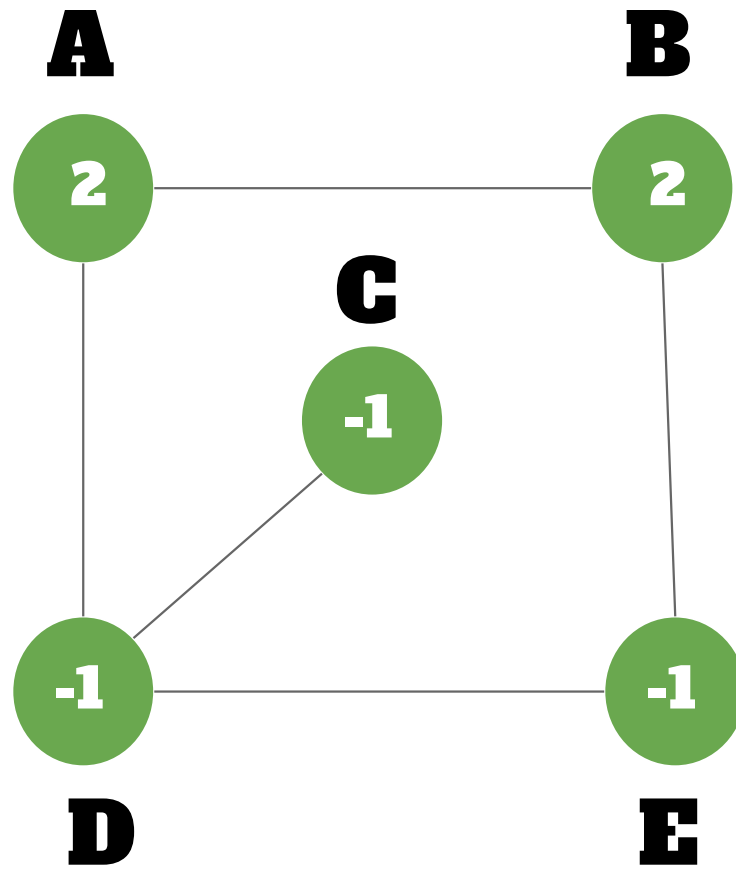
Puzzle 1:



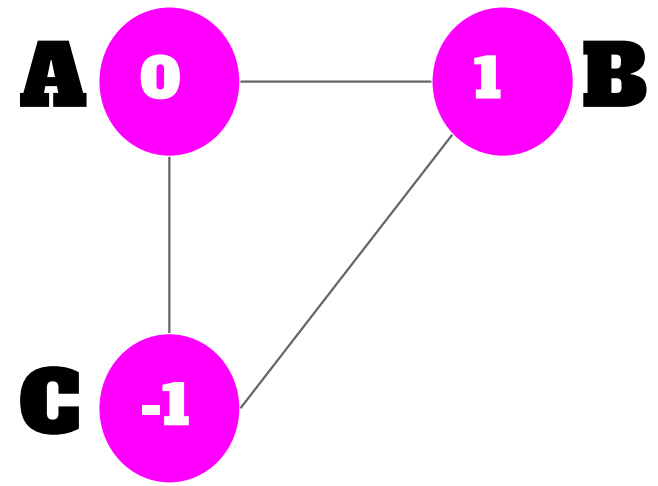
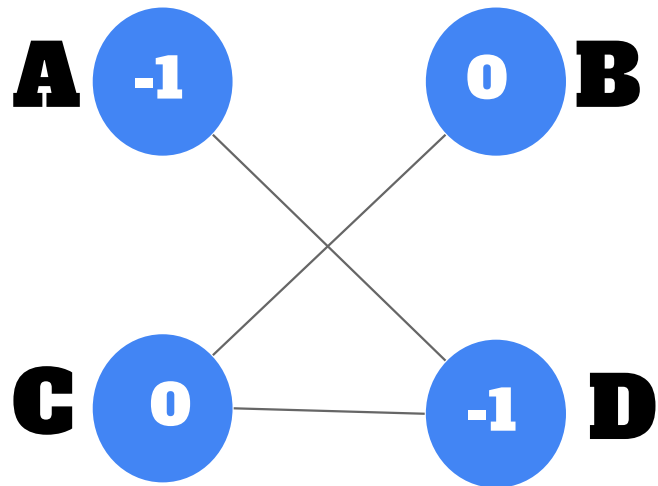
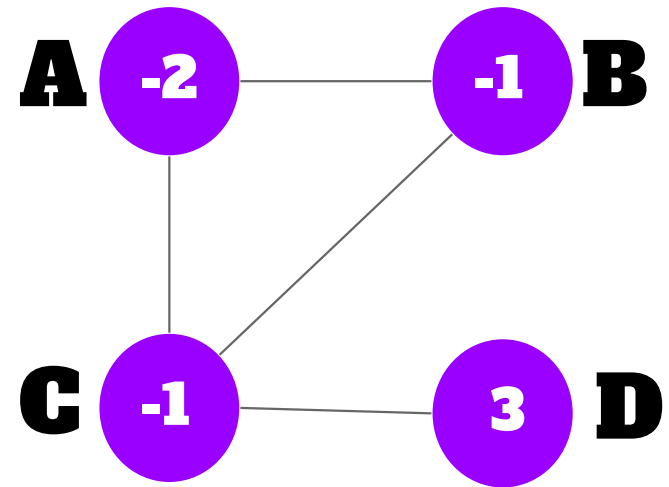
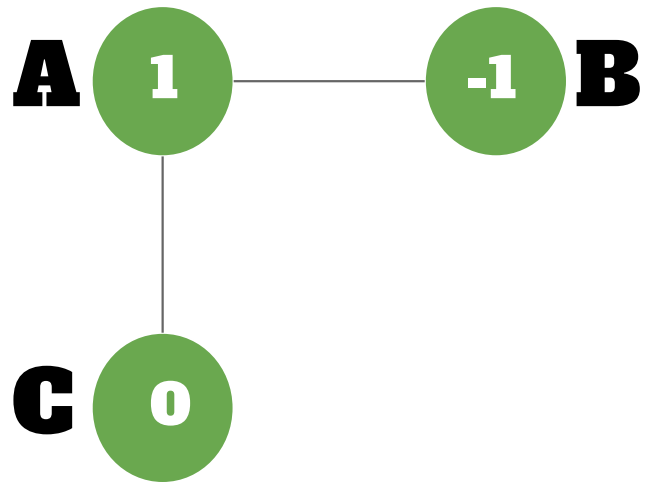
Puzzle 2:



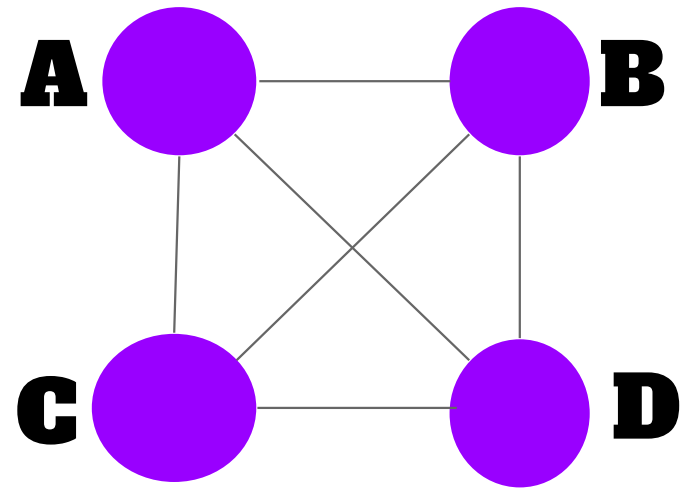
Puzzle 3:



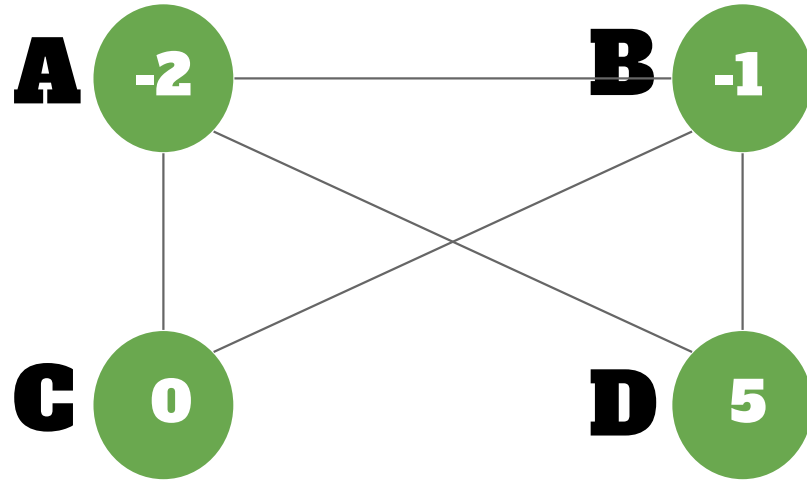
Are any of these graphs impossible to beat?



Can you create your own graph that is impossible to beat?



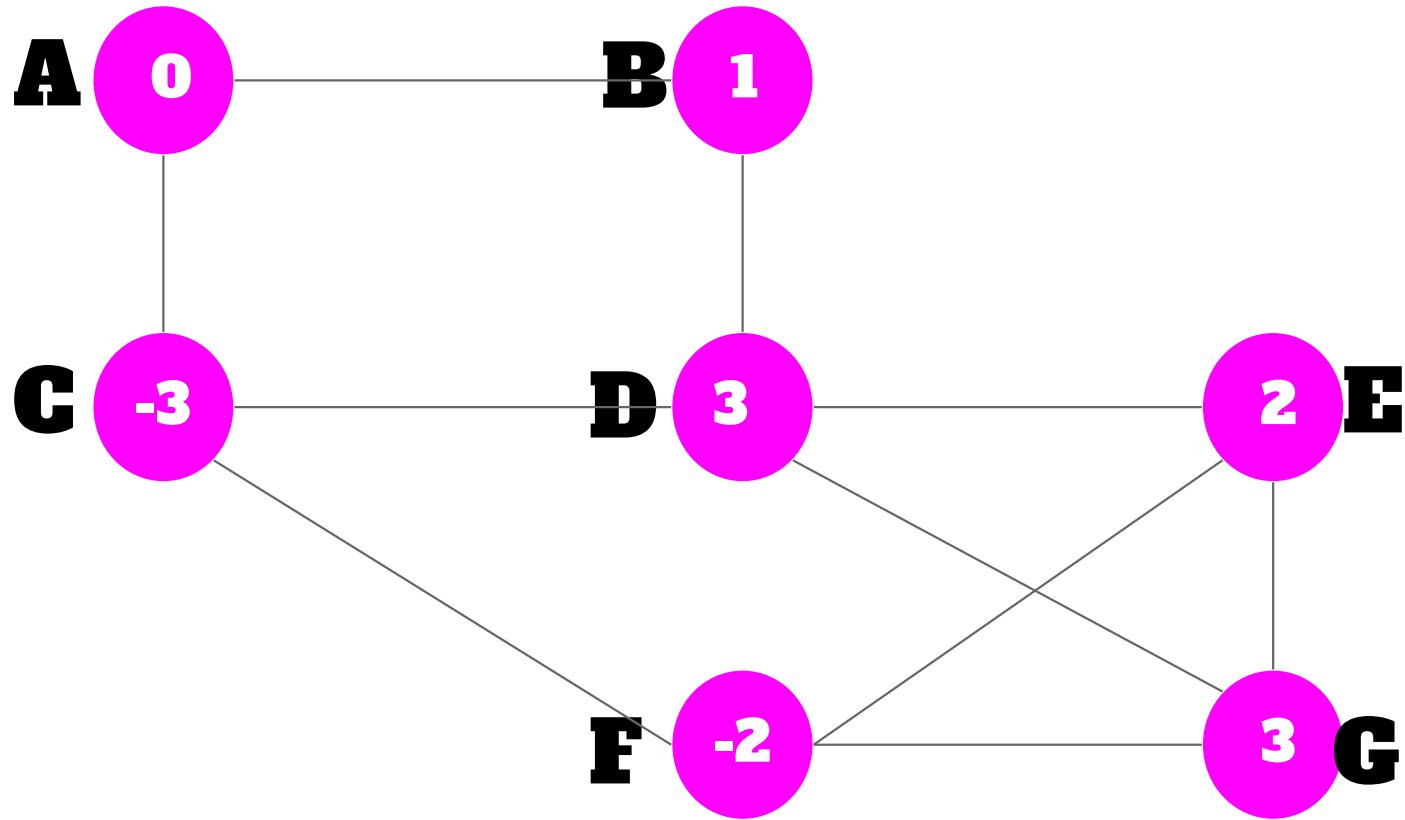
Define the genus = #edges - #vertices + 1



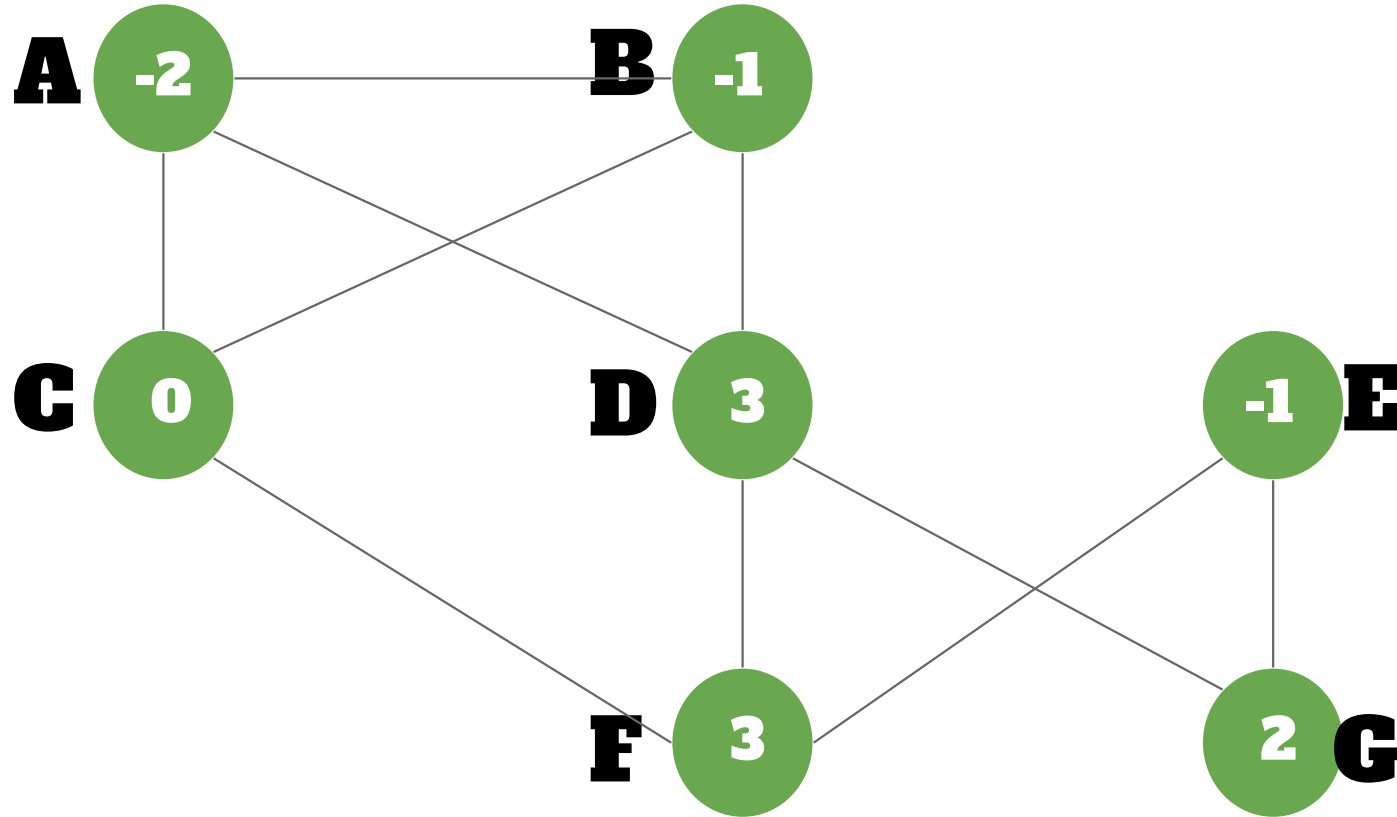
What is the genus here? 2

Can you detect some kind of relation between winning and the genus of a graph?

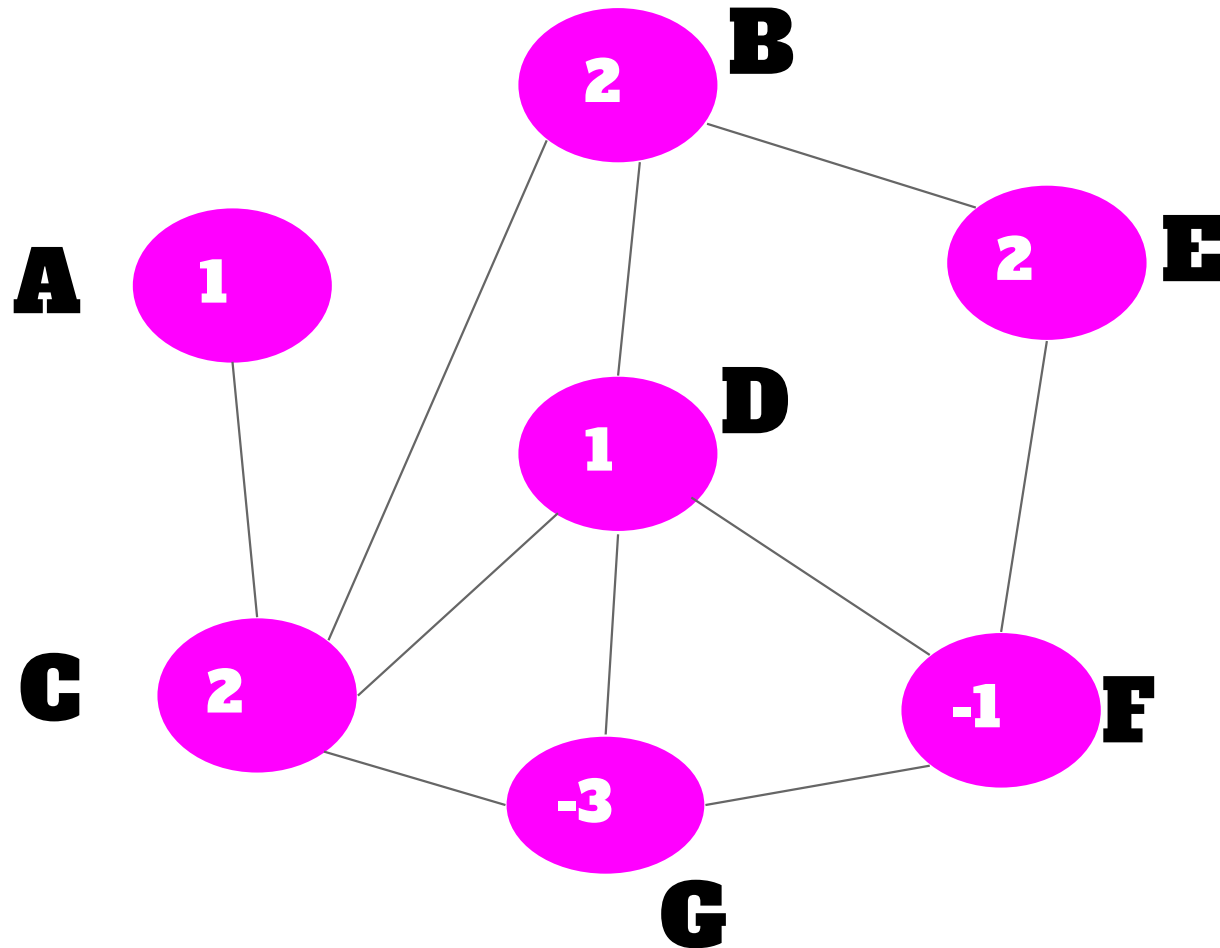
Puzzle 4: Try to do this in 14 steps or less



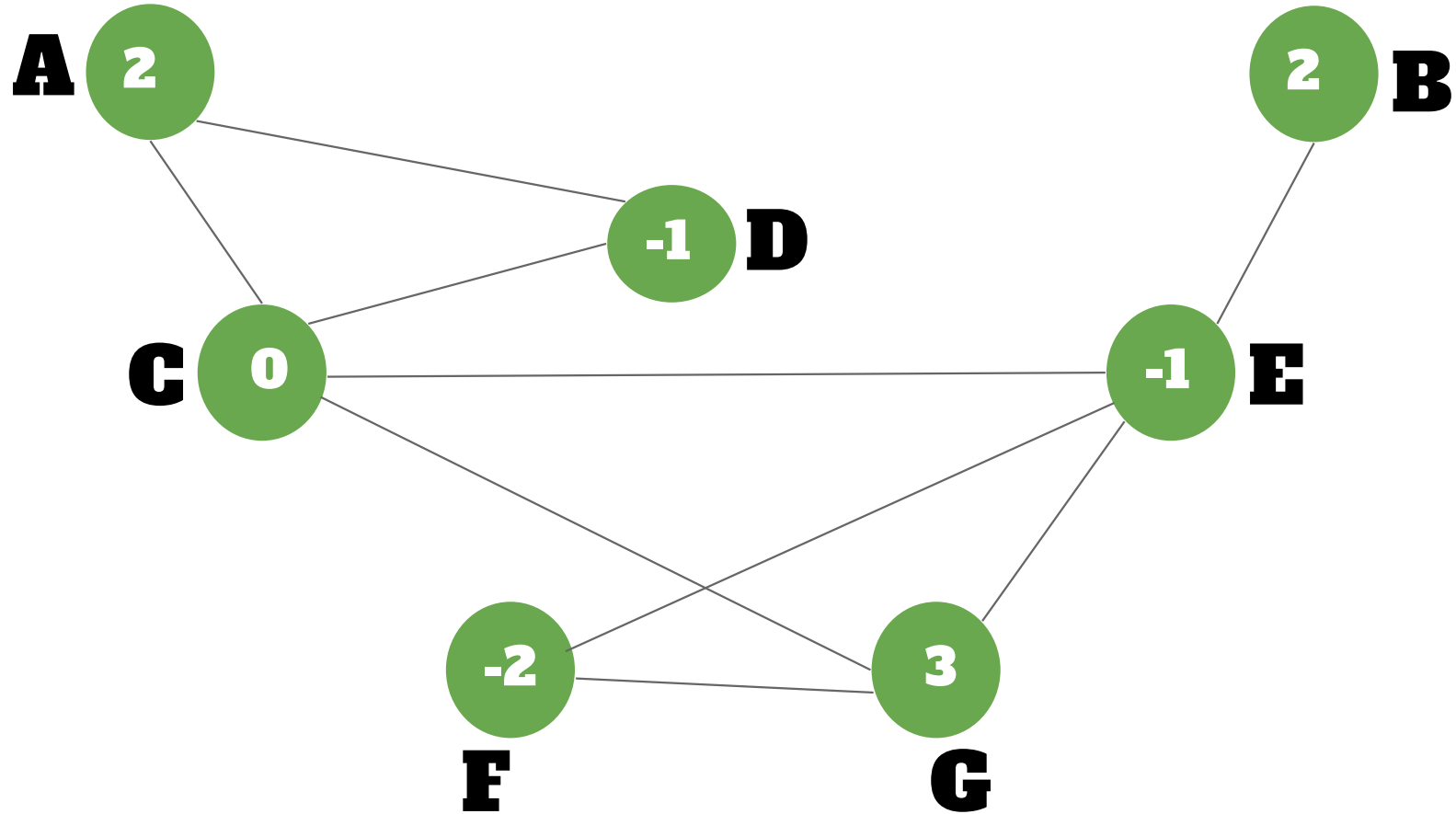
Puzzle 5: What is the fewest steps you can do this in?



Puzzle 6: Try to do this in 14 steps or less



Puzzle 7: What is the fewest steps you can do this in?



Puzzle 8:

