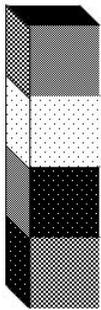


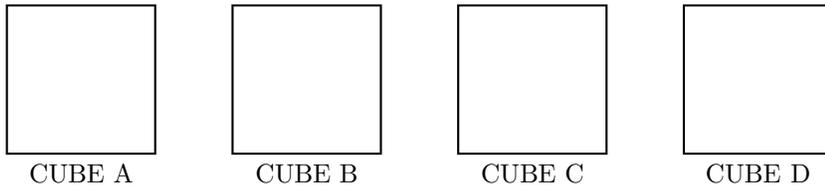
GRAPH THEORY HANDOUT
INSTANT INSANITY

Instant Insanity is a puzzle that was first marketed by Parker Brothers in 1967. It consists of four cubes, with each face painted one of four different colors (we'll be using red, blue, yellow and green). The object of the puzzle is to stack the four cubes one on top of the other, so that on each side of the stack each cube face is showing a different color - in other words so that each of the four colors shows on each side.

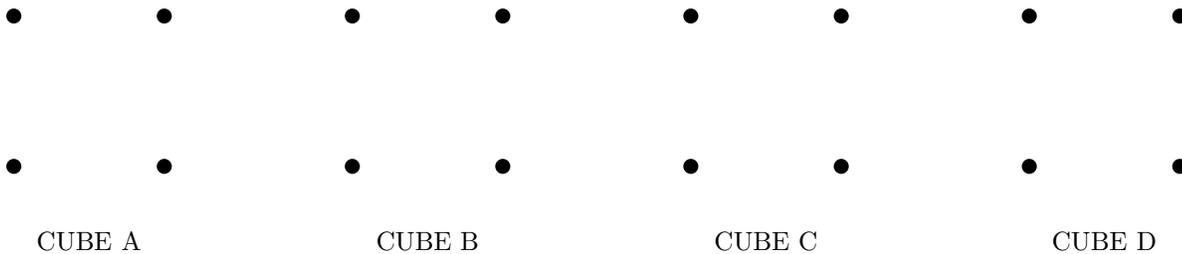
QUESTION: In general, how easy would this be to solve by trial and error? In other words, how many different ways can you arrange the cubes while stacking like this?



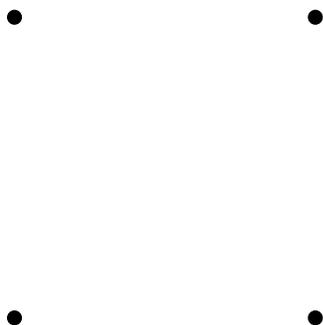
The squares below are provided as a place for you to put your cubes so that you can keep track of them and not lose your place.



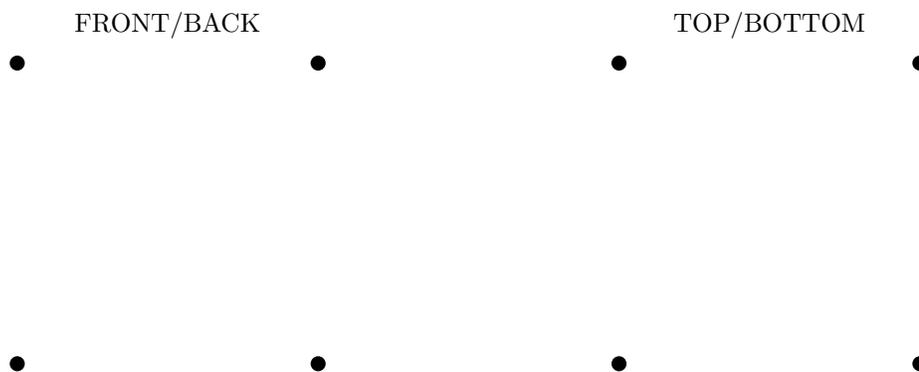
Draw a descriptive graph below for each of the cubes above.



Create a composite graph below containing all four graphs from the last page. Label each edge according to the cube it originally came from (A, B, C, or D) - or, rather than labeling, use 4 colored pencils to record which edge came from which cube.



Now, use the edges from the complete graph above to make two sub-graphs below. Each sub-graph should have one edge from each cube (for a total of 4), and each vertex should have order 2 (which will mean that each color is used twice - once each front and back, once each top and bottom).



Use the information from the subgraphs above to write up a chart describing the solution. Make sure that each column has each color listed once only. Rows can have repeated colors.

CUBE	FRONT	BACK	TOP	BOTTOM
A				
B				
C				
D				