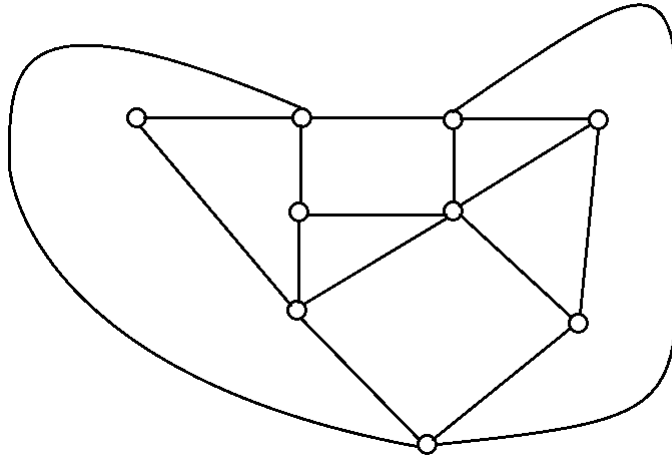
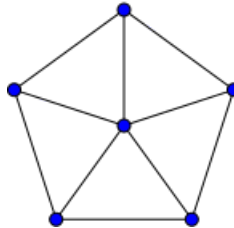


Homework 29, due November 10

- (1) 3-color the graph below.



- (2) (a) Show that the graph G below is not 3-colorable. (Hint: Show what goes wrong if you only use three colors. Choose a color for the central vertex first. Then show that the other two vertices forming a triangle have to be the other two colors. Try to color the rest of the triangles.)



- (b) Eve wishes to convince Bob she knows a 3-coloring of G . Eve and Bob engage in n rounds of the 3-coloring zero-knowledge protocol. How large should n be before Bob has $> 50\%$ chance of detecting Eve?
- (3) Read the Wikipedia page on the [P vs NP Problem](#) and write something that you learned. Don't worry about understanding everything you read.