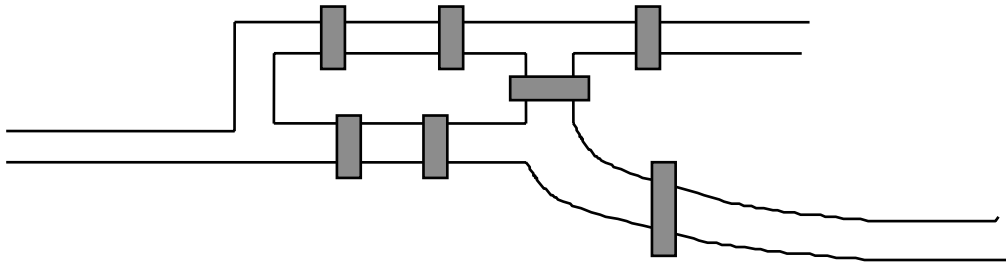
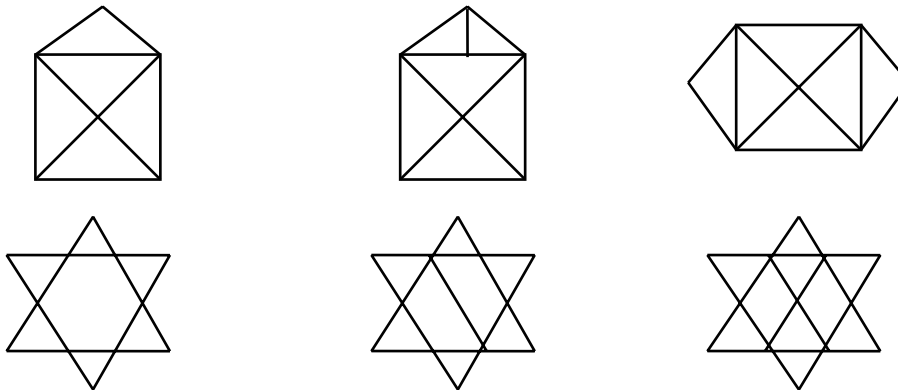


WEEK 1 - THE BRIDGES OF KONIGSBERG & GRAPH THEORY

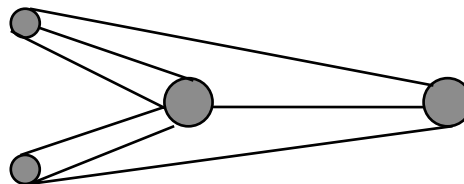
There once was a small town called Königsberg that had seven bridges connecting parts of the town over its several rivers. Emmanuelle wanted to know if she could walk from her house over each bridge and get back home without having to cross any of the bridges twice. See if you can help her figure out if this is possible, and what route to take? You can put Emmanuelle's house anywhere in the town, and you may need to move it to several different places before you solve the puzzle.



One field of mathematics, called graph theory, studies problems like the Bridges of Königsberg. If you draw the map of the Königsberg problem, you get a “graph”. Some networks can be traced without lifting your pencil and without drawing over the same line segment twice. Try tracing these figures. It may take you several tries to decide whether each one can be traced without lifting your pencil. Try to figure out why some of the drawings can be traced and some can't. (Look up the mathematician Leonhard Euler (1707-1783) to find out more about graphs and the Bridges of Königsberg problem.)



The Königsberg problem can be drawn with dots representing the parts of the town, and lines representing the bridges between the land masses. Maybe looking at the problem this way will help you work it out.



Check your library for *Math and Logic Games* by Franco Agostini. It has a great chapter called “Games with Geometrical Figures”. Also, see if you can find the shareware program “Tracer” on the Internet. It was written by Two Nice Guys, and has lots of graphs for you to trace!