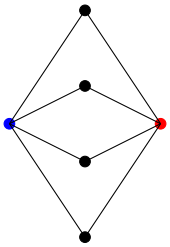
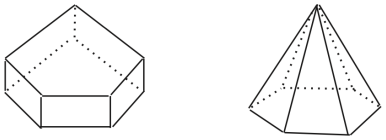
Exercise 3

Suppose that four houses are under construction and each house must be provided with a connection of each of two utilities. Under the same conditions as the Three Houses and Three Utilities problem, can these conditions be satisfied for this Four Houses and Two Utilities Problem?



Exercise 5

For the two polyhedra shown below, determine the number V of vertices, the number E of edges, and the number F of faces. Show that the Euler Polyhedron Formula holds in each case.



For the first polyhedron, we have $V = 10$, $E = 15$, $F = 7$, so $V - E + F = 2$.

For the second polyhedron, we have $V = 7$, $E = 12$, and $F = 7$, so $V - E + F = 2$.

Exercise 8a

Show that a knight's tour is not possible on a 4×4 chessboard.