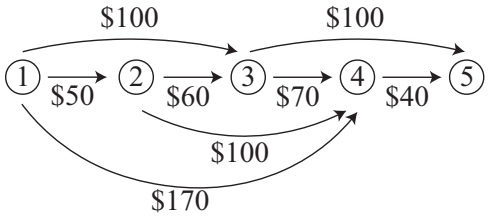
Math 294 Exercises on Applications

1. Given the following weighted directed graph, set up a convex optimization problem in standard form that seeks the minimal cost path, then determine the optimal path and its cost (either by hand or using Mathematica).



2. Given the following table of the cost for each agent to do each task, set up a convex optimization problem in standard form that seeks the matching of agents to tasks (one agent per task and one task per agent) that minimizes the total cost, then determine the optimal matching and its cost (you may use Mathematica or other software).

Agent	Task 1	Task 2	Task 3	Task 4	Task 5
#1	0	2	7	2	3
#2	1	3	9	3	3
#3	1	3	3	1	2
#4	4	0	1	0	2
#5	0	0	3	0	0

3. Given the following capacity information about a pipe network, set up a convex optimization problem in standard form that seeks the maximal flow, then determine the optimal flow through each pipe and the total flow achieved through the network (you may use Mathematica or other software).