

(a) True. If we feed the costs c_e^2 into Kruskal's algorithm, it will sort them in the same order, and hence put the same subset of edges in the MST.

Note: It is not enough just to say, "True, because the edge costs have the same order after they are sorted." The same sentence could be written about (b), which is false; it's crucial here to mention that there are minimum spanning tree algorithms that only care about the relative order of the costs, not their actual values.

(b) False. Let G have edges (s, v) , (v, t) , and (s, t) , where the first two of these edges have cost 3 and the third has cost 5. Then the shortest path is the single edge (s, t) , but after squaring the costs the shortest path would go through v .

¹ex941.760.334