

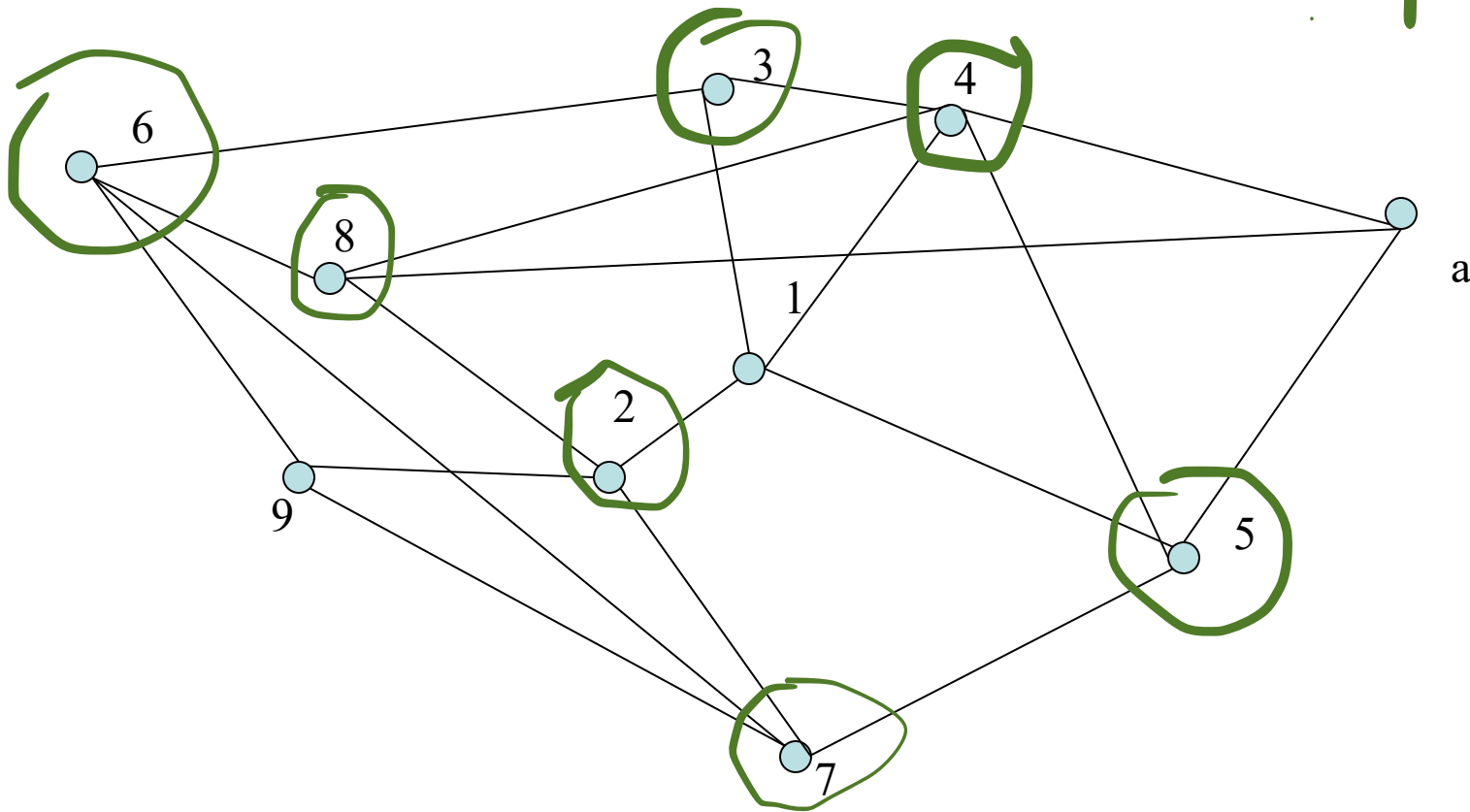
1. For minimum vertex cover problem in the following graph give

greedy solution = nodes 4, 2, 5, 1, 8, 7

2-VC solution = nodes 1, 2, 3, 4, 5, 7, 6, 8

Optimal solution = nodes _____

Approximation error of 2VC = 14% Approximation ratio of 2VC = 8/7



2. For the following graph, find

Optimal TSP tour 1,5,4,a,6,8,9,2,3,7,1

length = 35.9

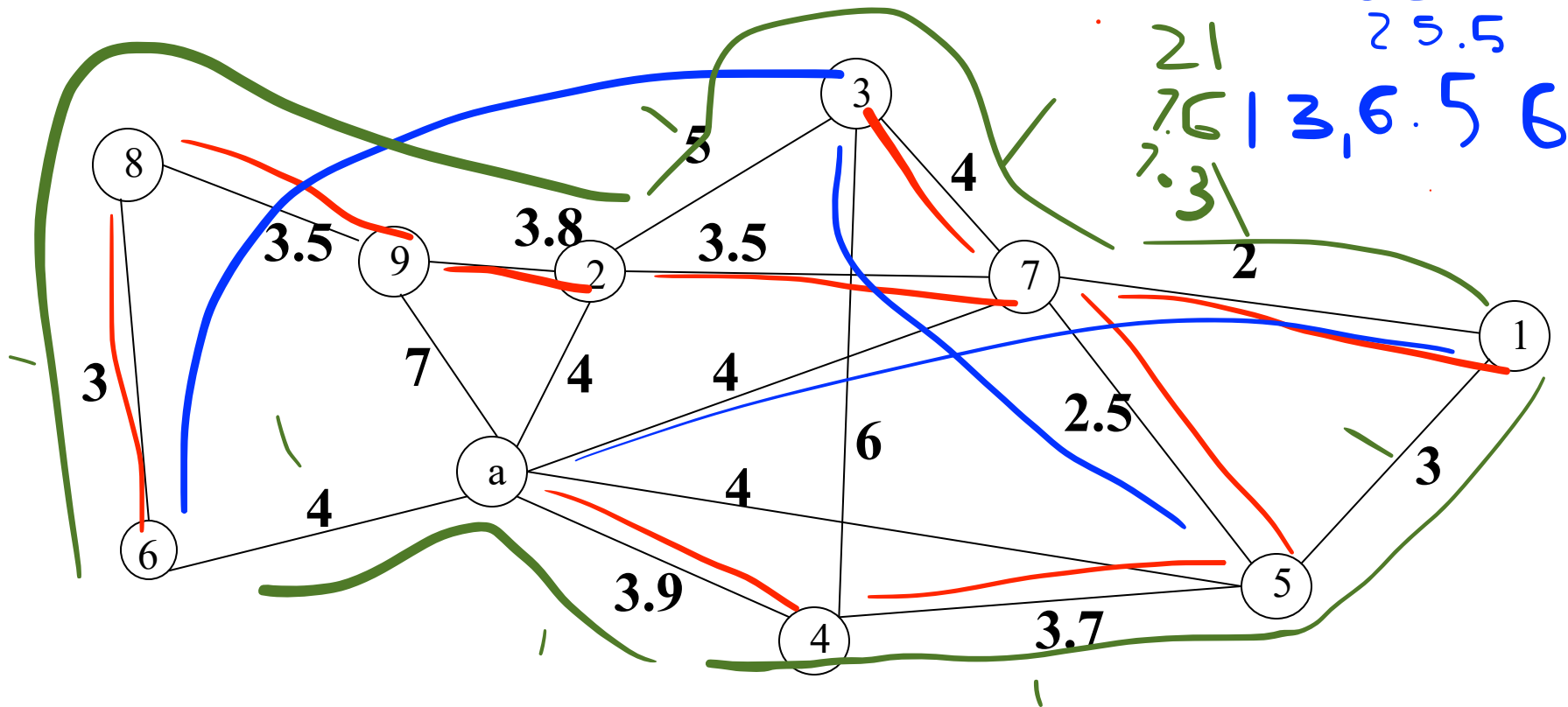
Double MST tour 1,7,2,9,8,6,8,9,2,7,3,7,5,4,a,4,5,7,1

length = 30.9 $\times 2 =$ 61.8

MST-heuristic tour (with shortcuts) 1,7,2,9,8,6,3,5,4,a,1

length = 55.5

The error of the MST-heuristic is 54.8 % $(55.5 - 35.9) / 35.9 = 0.549$



3. For the following graph, find

Christofides heuristic matching (a,6), (1,3) length = .10

MST+matching tour 1372986a4571 length = 40.9

Christofides heuristic tour (w/shorts) 1372986a451 length = 39.4

The error of the Christofides heuristic is 9.7% $(39.4-35.9)/35.9 = 0.097$

