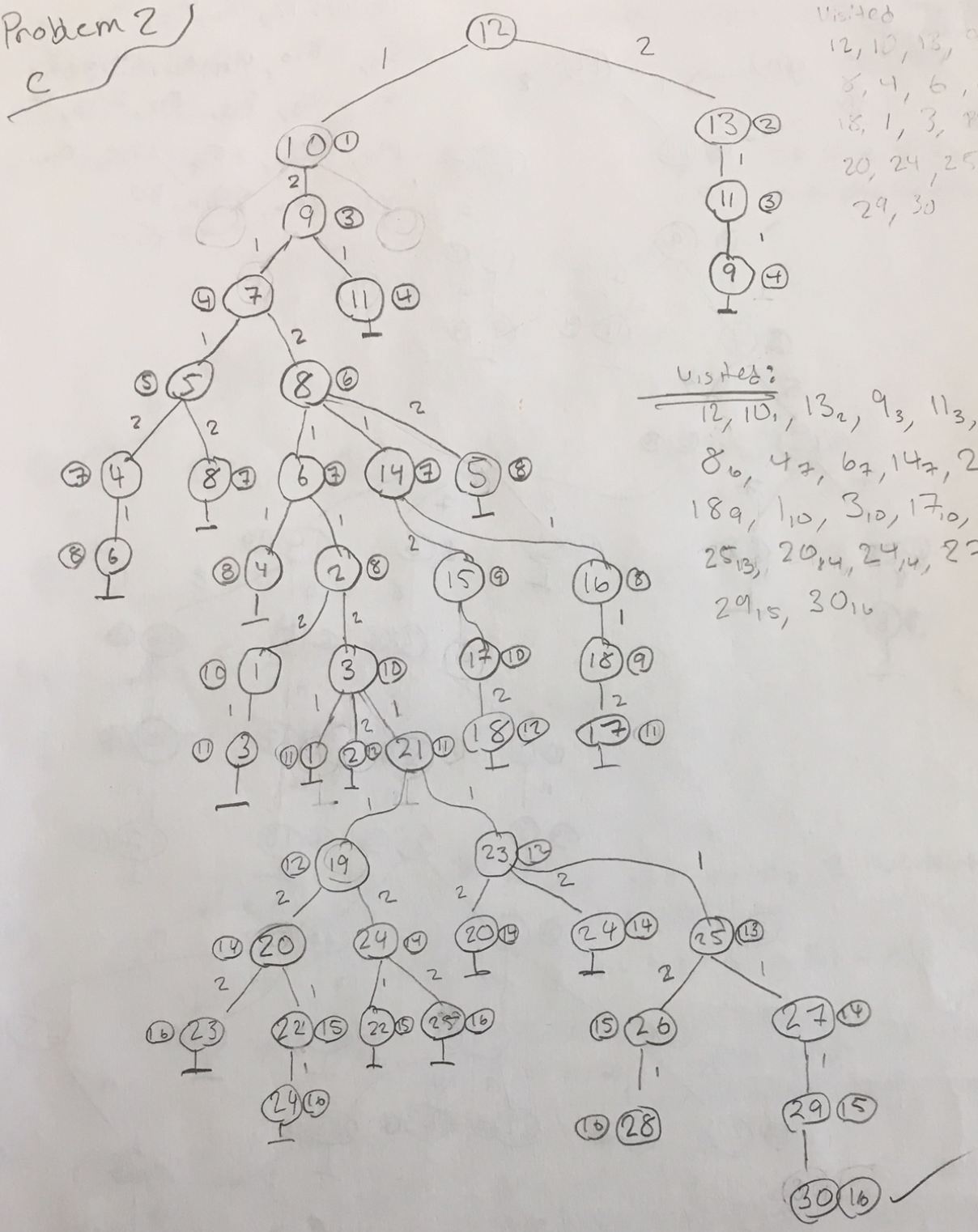
Problem 2

c



Visited

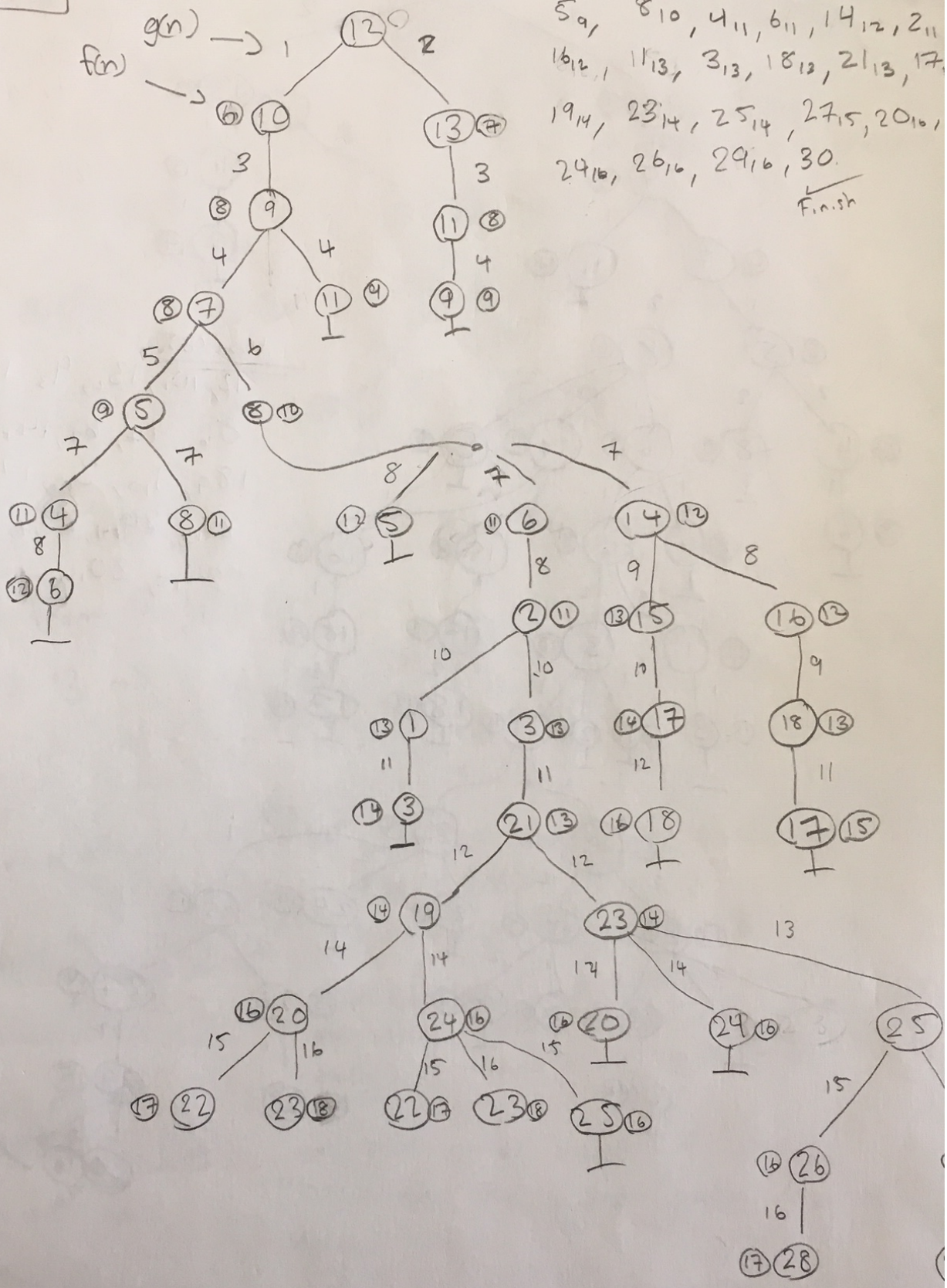
12, 10, 13, 9, 11, 7, 5
8, 4, 6, 14, 2, 16, 15
18, 1, 3, 17, 21, 19, 23,
20, 24, 25, 27, 22, 26
29, 30

Visited:

$12_1, 10_1, 13_2, 9_3, 11_3, 7_4, 5_5,$
$8_6, 4_7, 6_7, 14_7, 2_8, 16_8, 15_9,$
$18_9, 1_{10}, 3_{10}, 17_{10}, 21_{11}, 19_{12}, 23_{12},$
$25_{13}, 20_{14}, 24_{14}, 27_{14}, 22_{15}, 26_{15},$
$29_{15}, 30_{16}$

Problem 2D, C

$f(n) = g(n) + h(n)$



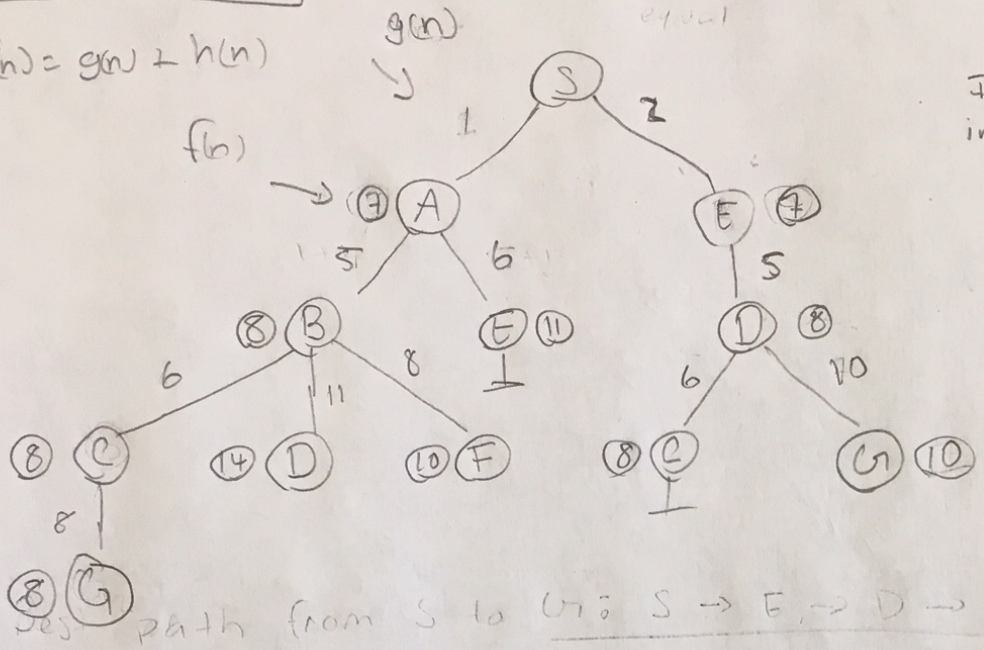
Visited: $12_0, 10_6, 9_8, 7_8, 11_8, 5_9, 8_{10}, 4_{11}, 6_{11}, 14_{12}, 2_{11}, 16_{12}, 11_{13}, 3_{13}, 18_{13}, 21_{13}, 17_{14}, 19_{14}, 23_{14}, 25_{14}, 27_{15}, 20_{16}, 24_{16}, 26_{16}, 29_{16}, 30$

Finish

Problem 3A-B

Visited order List: S, A, E, B, D, C, G

$f(n) = g(n) + h(n)$



If tie II go in in alphabetic order

Best path from S to G: S → E → D → G

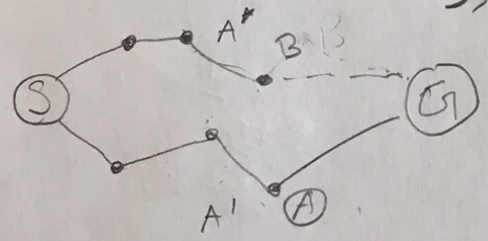
Best paths from S to G

S → A → B → C → G = 8

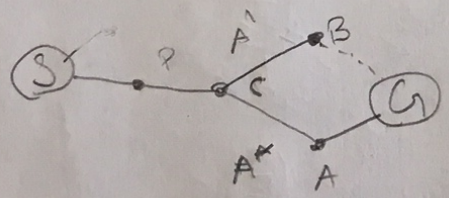
S → E → D → C → G = 8

3 (C)

1)



2)



3) A* did not extend B because

$f(A) \leq f(B)$

$g(A) + h(A) \leq g(B) + h(B)$

therefore if A and B are the same distance from G and $h(A) = h(B)$ then it means that $g(A) \geq g(B)$

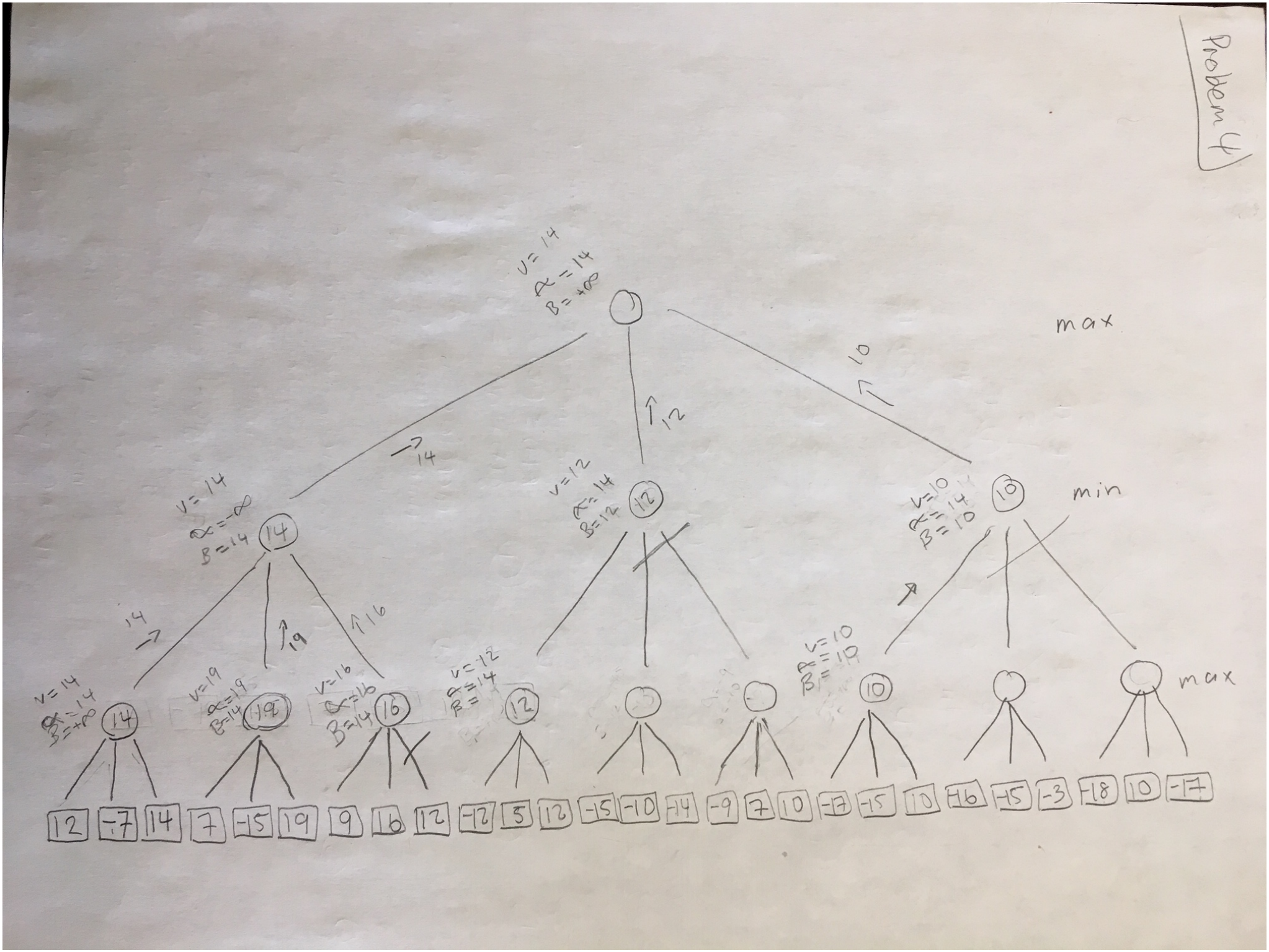
on the other hand if they are on the same path P. We know that

$g(C) + g(C,A) + h(A) \leq g(C) + g(C,B) + h(B)$

If $g(C,A)$ and $g(C,B)$ are also the same then we know that

$h(A) \leq h(B)$ and since the heuristic does not overestimate path P' is longer or equal to OPT path.

Problem 4


v=14
α=14
β=+∞
max
14
12
10
v=14
α=-∞
β=14
14
v=12
α=14
β=14
12
min
v=10
α=14
β=10
10
14
19
16
v=14
α=14
β=+∞
14
v=19
α=19
β=14
19
v=16
α=16
β=14
16
v=12
α=14
β=
12
v=10
α=19
β=
10
max
12 -7 14 7 -15 19 9 16 12 -12 5 12 -15 -10 -14 -9 7 10 -17 -15 10 -16 -15 -3 -18 10 -17