Kern Espinoza
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Assignment 4 Write-Up

1)

a)

Iterations (n)	Duration (seconds)
10,000	0.012
100,000	0.133
1,000,000	1.361

b)

i) 10000/10000000 = 0.012/t

ii) t = 12

iii) Time to run n=10,000,000 should be about **12 seconds.**

2)

a)

Iterations (n)	Duration (seconds)
1,000,000	0.0000001

b) This function was difficult to time, so this may not be the most accurate result.

i) Should be O(logn) because the algorithm only traverses left edge nodes.

ii) 1000000/10000000000 = 0.0000001/t

iii) t = 1/1000

iv) Time to run n=10,000,000,000 should be about **0.0001 seconds.**

6)

a)

Iterations (n)	Duration (seconds)
5,000	0.004
10,000	0.01
15,000	0.024

b) My implementation of intersectionWith() is a recursive algorithm which traverses the second (other) set, checking to see whether each node exists within the first set. This comparison check should run in O(logn) thanks to the ordered nature of the set. Because there is exactly one comparison check per node within the set, the final complexity should be **O(n * logn)**.