Classwork: Binary search calculations

My binary search algorithm takes about 9ms to search a 10,000 entry array, and about 13ms to search 1,000,000 elements. How long would I expect it to take to search 10,000,000 elements

log2(10,000) = 13 steps = 9ms
log2(1,000,000) = 20 steps = 13ms
log2(10,000,000) = 23 steps = x

We can calculate the ms per step for the first 2 cases:

9/13 = **0.69 ms/step**

And

13/20 = **0.65 ms/step**

The **average** would be **0.67 ms/step**

It takes us 3 more steps from n = 1,000,000 to n = 10,000,000 so 0.67*3 should be the extra milliseconds required for n = 10,000,000.

(0.67ms/step)*3steps = 2 ms

Answer: 15ms