

Hi Folks,

For about the past four years I have been writing a math/puzzle story for the bi-monthly publication of the National Association of Watch and Clock Collectors (NAWCC). The puzzles always involve my two protagonists Mr. Sherlock Holmes and his friend Dr. John Watchson (I am quite proud of coming up with those!). Here is one of the puzzles (with NAWCC changed to G4G14). The answer is below. I hope you enjoy it. ~Jim Guinn

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The Adventures of Sherlock Holmes – Bird Watching

Consulting Time Expert Sherlock Holmes entered their London apartment to find his good friend Dr. John Watchson staring at his new Cuckoo Clock. “Taken up bird watching, I see, Watchson.” “Very funny, Sherlock. Actually I’m puzzled about something”, said Watchson. “Well, that’s not unusual. What is it?” said Sherlock. “I’ve noticed that of the two weights on this cuckoo clock, the left one drives the time hands, the right one drives the cuckoo. The chains themselves are identical. The left one descends one link every two minutes, while the right one descends four links for every cuckoo. It starts to cuckoo on the hour one cuckoo per hour, and on the half-hour just one cuckoo. I started the weights at exactly the same height at twelve o’clock just before it started to cuckoo. I’m wondering if the weights will ever be at exactly the same height again.” “Well,” said Sherlock, “you can stand there and watch it for the next twelve hours, or I’m sure someone from G4G14 can help you with it. I’m going to take a nap and please don’t let your cuckoo fiddling wake me up!”

Can you help Dr. Watchson figure out this Cuckoo Puzzle? That is, can you determine the time, or times, when the weights will be at the same height? To determine the exact time, you would need to know how the time weight descends as the clock ticks, and how quickly the cuckoo descends with each cuckoo. For this puzzle, finding the time(s) to the closest minute is fine.

Answer:

Amazingly, (according to my calculations) the weights will be the same height at six different times (per twelve hour period)! The first will be after the weights have each dropped 60 links, at 2:00 o’clock just before the cuckoo cuckoos. The second is at 68 links, at 2:16 o’clock, the third at 300 links at 10:00 o’clock after the cuckoo has cuckooed 8 of its 10 cuckoos, the fourth at 308 links at 10:16 o’clock, the fifth at 330 links at 11:00 o’clock after the cuckoo has cuckooed $4\frac{1}{2}$ of its 11 cuckoos, and then the sixth and last, at 360 links, which is where the weights started out together at 12:00 o’clock just before the cuckoo cuckoos!