

Donkey Riding

20 June 2024

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This is a simple 1917 puzzle from Henry Dudeney ([1]).

During a visit to the seaside Tommy and Evangeline insisted on having a donkey race over the mile course on the sands. Mr. Dobson and some of his friends whom he had met on the beach acted as judges, but, as the donkeys were familiar acquaintances and declined to part company the whole way, a dead heat was unavoidable. However, the judges, being stationed at different points on the course, which was marked off in quarter-miles, noted the

following results:—The first three-quarters were run in six and three-quarter minutes, the first half-mile took the same time as the second half, and the third quarter was run in exactly the same time as the last quarter. From these results Mr. Dobson amused himself in discovering just how long it took those two donkeys to run the whole mile. Can you give the answer?

My Solution

Let the times for each quarter of the one mile race be as in Figure 1. Then from the problem statement we have

$$T_1 + T_2 + T_3 = 6 \frac{3}{4} \text{ min}$$

$$T_1 + T_2 = T_3 + T_4$$

$$T_3 = T_4$$

Then

$$T_1 + T_2 = T_3 + T_4 = 2 T_3$$

and

$$T_1 + T_2 + T_3 = 3 T_3 = 27/4$$

so

$$T_3 = 9/4$$

Therefore

$$T_1 + T_2 + T_3 + T_4 = 4 T_3 = 9 \text{ min.}$$

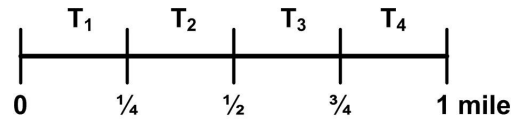


Figure 1

Dudeney Solution

I'm not sure this constitutes a "solution", but it does provide the answer.

The complete mile was run in nine minutes. From the facts stated we cannot determine the time taken over the first and second quarter-miles separately, but together they, of course, took four and a half minutes. The last two quarters were run in two and a quarter minutes each.

References

[1] Dudeney, Henry Ernest, "73. Donkey Riding", *Amusements In Mathematics*, 1917

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