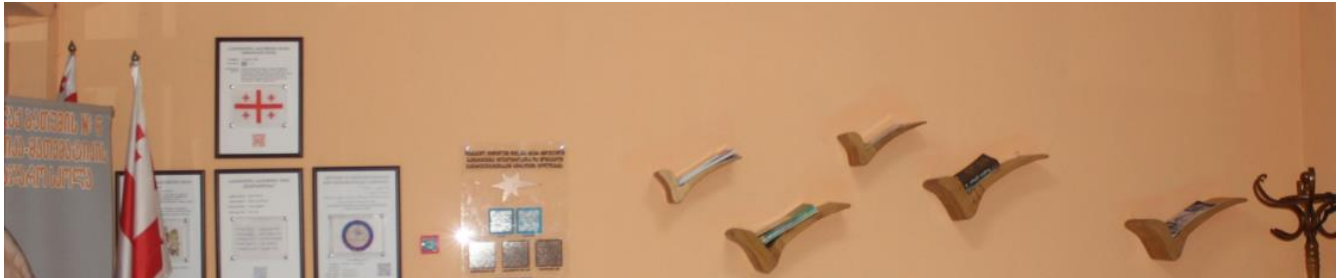




Monday cup #24- Solution

Posted on:September,16, 2019

Due on:September,29, 2019



Problem

Question: At noon, Guga, who is in training for a bicycle race, left Abbey to ride to "Kvesauri" and back again. It is 26 miles each way. She did the double journey without stopping and maintained a uniform speed throughout.

Some time later Gigi, trying out his new car, left "Kvesauri" and drove--also maintaining a uniform speed--to Abbey and back again. Gigi passed Guga on the latter's outward journey 7.5 miles from "Kvesauri" and passed her again on her return journey 5.5 miles from "Kvesauri". Gigi finished the double journey at 3:20 pm.

What time was it when Guga was back at Abbey?

SOLUTION: Between their two meetings Guga Jill covers 7.5 miles into "Kvesauri" and 5.5 miles back towards Abbey, a total of 13 miles, at a uniform speed of s miles per hour. During the same interval of time Gigi Jack covers 18.5 miles into Abbey ($26 - 7.5 = 18.5$) and 20.5 miles back towards "Kvesauri" ($26 - 5.5 = 20.5$), a total of 39 miles, at a uniform speed of r miles per hour. Since these two times are equal,

$$\frac{13}{s} = \frac{39}{r}$$

from which we have $r = 3s$.

At the time of their second meeting Guga had been pedaling for $(26 + 5.5)/s = 31.5/s$ hours. Also, the time from this meeting until Gigi returns to "Kvesauri" at 3:20 pm is $5.5/r = 5.5/3s$ hours. Since the sum of these two times equals the difference between the time of Gigi's return to "Kvesauri" and Guga's departure from Abbey, it follows that

$$\frac{31.5}{s} + \frac{5.5}{3s} = \frac{10}{3}$$

$$94.5 + 5.5 = 10s$$

whence $s = 10$ miles per hour. This means that Guga covered the 52 miles in 5.2 hours to arrive back at Abbey at 5:12 pm.

There was no correct solution to problem 24

Rules

1. Anyone is eligible to participate. Each solution is to be the work of one individual without any input from faculty or others. An answer must be accompanied by appropriate justifications to be considered correct.
2. The solution is to be submitted with the solver's name, email, year in school (if applicable), local phone number, and local address. If you are submitting this for possible credit in a class, include your class number and instructors name.
3. The solution is to be typed or legibly written. Solutions must be submitted to the by 2 p.m. on the due date.
4. Entries will be graded on clarity of exposition and elegance of solution. An award of **GEL10** will be given for the best correct solution. In the case of a two-way tie, the award will be split. If there are more than two best solutions, a drawing will be held to determine two award winners.
5. Graduate students, faculty, and members of the general public are encouraged to submit solutions, but they will not be considered.

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Solution for this problem can be submitted proveweek@gmail.com