Quarterly Problem

- Math Edition -

Population assessment via running?

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→ A lot of runners often jog the same route. Not only can running have a positive impact on your health but can also influence one's good mood. Therefore, Alice runs at least once a week: One lap circling around her hometown, giving her a perfect view of her village.

During the past years many new houses have been built within chic neighborhoods. Her route leads her exactly along the outskirts of the village: Alongside houses on the one side, fields on the other. On her last run, she asks herself how many people might approximately live in her home town.

How might Alice be able to estimate the population via her running route?

Ask yourself which information Alice needs for her calculations. How many houses might exist in the village if she is able to run around it within her five-kilometer route?

Brainstorm-Box
How can one approximate the 5-kilometer route geometrically?
How big is one estate and how many people might live in one household?
How would the assumptions of the 5-kilometer route differ from one in a city?

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Whose method is most accurate?

Make sure to present your approach precisely and comprehensibly.
Furthermore, indicate what mathematical foundation you've been using, structuring your respective estimation.