

Problems to Ponder

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Volume/Issue: Volume 116: Issue 5

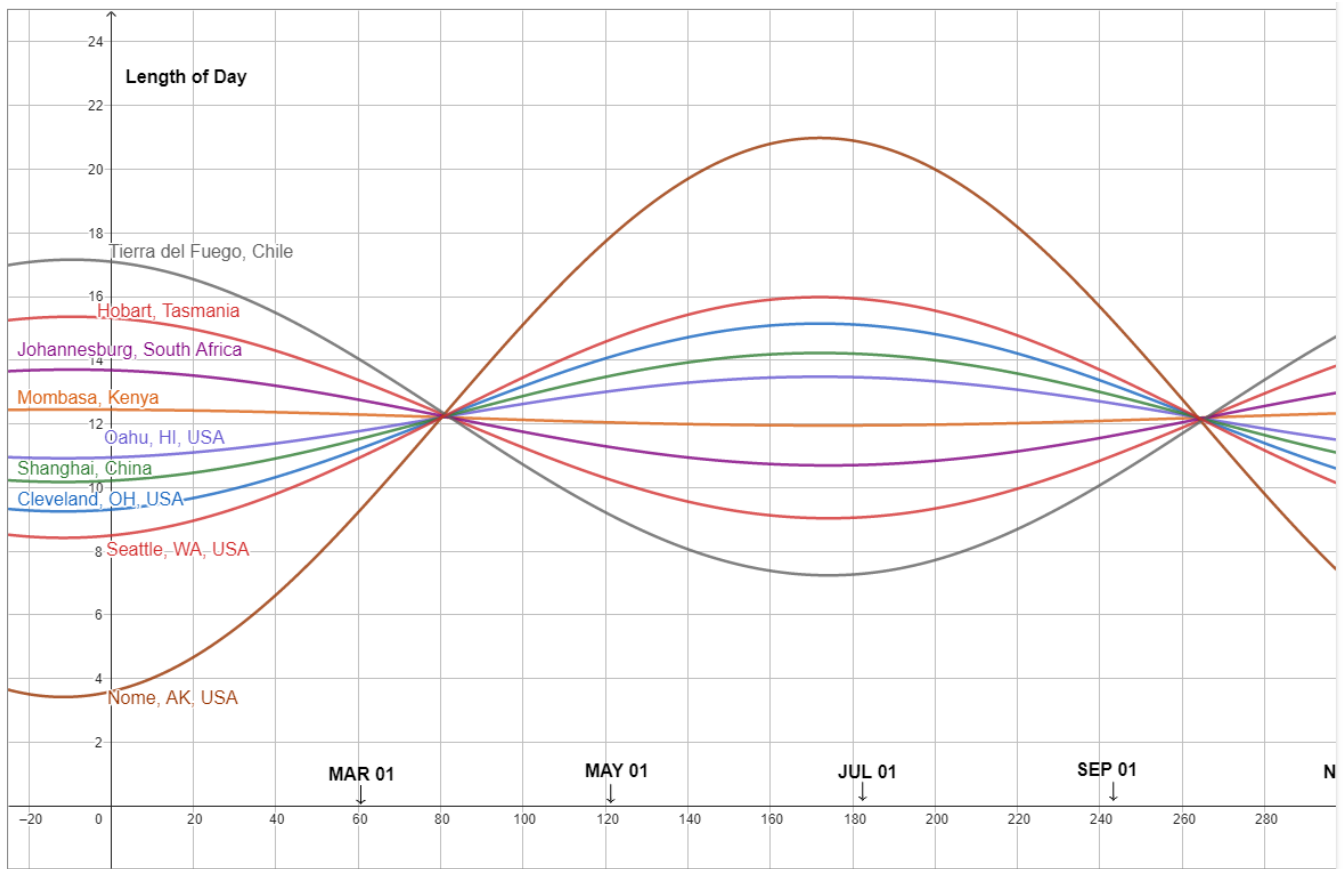
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DOI: <https://doi.org/10.5951/MTLT.2023.0116>

Problem 24:

The image below shows graphs of the approximate daylight hours throughout a year for eight cities: Tierra del Fuego, Chile; Hobart, Tasmania; Johannesburg, South Africa; Mombasa, Kenya; Oahu, Hawaii, USA; Shanghai, China; Cleveland, Ohio, USA; and Nome, Alaska, USA. Using only the information provided in the graph of daylight for the eight cities, answer the following questions.

- Which city is closest to the equator?
- Which city is farthest from the equator?
- How can you tell which of these cities are south of the equator?
- Explain how you know your answers are correct.



[Author-created Geogebra image at <https://www.geogebra.org/m/j2mn5tka>]

For further thought: On which two dates of the year do all eight graphs coincide?

Solution:

Mombasa is closest to the equator, and Nome is the farthest away because the length of days does not change much during the year for cities near the equator, and they change dramatically for cities near the poles. Because cities north of the equator have their longest days (summer) in the middle of the calendar year, they have maximum points in the middle of the graph at the same time that southern cities have minimum points.

For further thought:

The two coinciding points are the equinoxes. Cities north of the equator call the equinox in March the spring equinox and the one in September the fall equinox. On those two days, the length of daylight and nighttime are roughly equal for every city on the planet. The name equinox is from Latin, in which equi- means equal, and -nox means night.