

Maths Circle India: Module 8, Session 1
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Friday the 13th

As per Western superstition, Friday the 13th is considered an unlucky day. It occurs when the thirteenth day of a month in the Gregorian calendar (the calendar that we use) falls on a Friday. The superstition around Friday the 13th is so deep-rooted that there is a series of horror/mystery movies on this theme. If you would like to know more about the history of Friday the 13th, please refer to the following Wikipedia link:

https://en.wikipedia.org/wiki/Friday_the_13th.

Here are a few observations on Friday the 13th:

- 2023 has two such days: 13th January and 13th October.
- 2022 had just one Friday the 13th (on May 13).
- 2015 had three such days: 13th February, 13th March, and 13th November.

Keeping the above observations in mind, the following questions arise naturally:

- (a) Will every calendar year have at least one Friday the 13th?
- (b) Can there be a calendar year in which there are more than three such days?

Problem 1: Answer the above questions.