Using Arithmetic To Determine a Future Time

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This research presents the systematization of patterns in the Gregorian calendar relating the dates and days of the week. After this observation, the Ammer quotient was deduced, in which the division algorithm and modular arithmetic where applied to calculate congruences in the calendar. This curiosity arises from the fact that dates and the calendar are an instrument of social organization for daily use. They are also used a to plan future events, review events from the past, and make decisions that affects the present and future, among other strategic uses. On the other hand, this research will help teachers provide examples of a mathematical and scientific investigation to people who know less of the investigative process, through analyzing a set of data and the development of a formula based on the observed patterns. The elements that where studied were mainly leap and non-leap years, the sequences and patterns in the days of the week, and the cyclical changes that exist in the present data. To prove the hypothesis, an initial date was related to a future date to reason the Ammer quotient by adding the difference years, and the number of leap years between both dates, then dividing by the number of days in a week. As part of the experimentation, the Ammer formula was then utilized in twenty different cases and in all twenty cases it was proven to fulfill its functions.