▶ Extending Concepts

Bayes' Theorem **In Exercises 23–26, use the information below.**

For any two events with probabilities greater than 0,

$$\text{Probability of event 1 given event 2} = \frac{\left(\begin{array}{c}\text{probability of event 2} \\ \text{given event 1}\end{array}\right)\left(\begin{array}{c}\text{probability} \\ \text{of event 1}\end{array}\right)}{\text{probability of event 2}}.$$

23. You have the following information about students at a college.

    • 49% of the students are male.

    • 11% of the students are nursing majors.

    • 9% of the nursing majors are male.

    What is the probability that a student is a nursing major given that the student is male?

24. You have the following information about students at a college.

    • 51% of the students are female.

    • 10% of the students are history majors.

    • 60% of the history majors are female.

    What is the probability that a student is a history major given that the student is female?

25. You have the following information about voters in a local mayoral election.

    • 61% of voters were registered Republican.

    • 53% of voters voted Republican.

    • 86% of voters who voted Republican were registered Republican.

    What is the probability that a voter voted Republican given that the voter was registered Republican?

26. You have the following information about voters in a local congressional election.

    • 74% of voters were registered Democrat.

    • 62% of voters voted Democrat.

    • 79% of voters who voted Democrat were registered Democrat.

    What is the probability that a voter voted Democrat given that the voter was registered Democrat?