

Name \_\_\_\_\_

Date \_\_\_\_\_

## Foul Play

The Hawks were leading the Pistons in basketball by a score of 100–98. Just as time was running out, a Pistons player tried a 3-point shot. His defender had two choices: allow the shot, or stop it by fouling the Pistons player. Fouling would give the Pistons player 3 one-point free throws. The defender chose to foul and later wondered if it was a good choice.



- (1) To analyze the defender's choice, let's assume that for the Pistons player, every 3-point shot has a probability  $\frac{1}{3}$  of going in, and every free throw has probability 90% of going in.
  - (a) If the defender allows the shot, what is the probability that the shot wins the game as time runs out?
  - (b) If the defender stops the shot by fouling, estimate the probability that the free throws win the game.
- (c) Write a paragraph arguing for or against the defender's choice, based on probability calculations and/or simulations.