Journalist Sandy Tolan reported in the book *Hank and Me* that in 1999 there were fewer minorities coaching at third base than at first base. Tolan argued that since third base is the more challenging of the two positions and typically leads to more managing responsibilities, this discrepancy constitutes evidence of discrimination against minority coaches. Of the 60 base coaches in Major League Baseball that year (30 at first base; 30 at third base), 21 were minorities. Of these 21, only 6 coached at third base.

1. Use the given information to complete the following contingency table:

| | Caucasian Coach | Minority Coach | Total |
|---|---|---|---|
| First Base Coach | _____ | _____ | _____ |
| Third Base Coach | _____ | _____ | _____ |
| Total | _____ | _____ | 60 |

2. Is the base coached independent of the racial status of a coach? Defend your answer using probability calculations.

3. Calculate the proportion of Caucasian coaches who coach third base. Then calculate the proportion of minority coaches who coach third base. We can compare the two populations by calculating:

$$\text{relative rate} = \frac{\text{proportion of successes in Group \#1}}{\text{proportion of successes in Group \#2}}$$

The relative rate tells us how more likely it is for Caucasian coaches to coach third base than it is for minority coaches. Calculate this relative rate statistic. Does this statistic support Sandy Tolan's claim of discrimination against minority coaches?
Note: It is often standard to put the group with the lower rate of successes in the denominator.

4. Use hypergeometric probabilities to calculate the likelihood of observing data as extreme as we actually observed (Only 6 minorities coached at third base. If we assume race played no factor in coaching assignments, how likely is it that we would have observed 6 or fewer minorities coaching at third base?). Interpret this probability. Do you conclude that this provides evidence of discrimination against minority coaches? Explain.