Chapter 11 FRAPPY!
Scoring Guidelines

Intent of the question The primary goals of this question are to assess a student's ability to: (1) State hypotheses for a chi-square test for homogeneity; (2) Describe a Type I error and a Type II error in context; (3) Check the conditions for a chi-square test for homogeneity; and (4) Use the results of a simulation to estimate a *P*-value and make an appropriate conclusion.

Model Solution

(a) H_0: The true distribution of responses is the same for the two questions

H_a: The true distribution of responses is not the same for the two questions

(b) Type I: Finding convincing evidence that the true distribution of responses is different for the two questions, when the true distributions really are the same.

Type II: Not finding convincing evidence that the true distribution of responses is different for the two questions, when the true distributions really are not the same.

(c) We should not use a chi-square distribution to estimate the *P*-value because the Large Counts condition is not met. All of the expected counts are less than 5:

	A	B
Very important	4.5	4.5
Important	3.5	3.5
Somewhat important	2.5	2.5
Not that important	1.5	1.5
Not important at all	3	3

(d) Because 24 of the 100 trials resulted in a χ^2-value of 6.12 or more, the *P*-value $\approx$ 0.24. Because the approximate *P*-value of 0.24 is greater than $\alpha = 0.05$, we fail to reject H_0. We do not have convincing evidence that the true distribution of responses is different for the two questions.