7. Testing a Lie Detector The table below includes results from polygraph (lie detector) experiments conducted by researchers Charles R. Honts (Boise State University) and Gordon H. Barland (Department of Defense Polygraph Institute). In each case, it was known if the subject lied or did not lie, so the table indicates when the polygraph test was correct. Use a 0.05 significance level to test the claim that whether a subject lies is independent of the polygraph test indication. Do the results suggest that polygraphs are effective in distinguishing between truths and lies?

	Did the Subject Actually Lie?	
	No (Did Not Lie)	Yes (Lied)
Polygraph test indicated that the subject lied.	15	42
Polygraph test indicated that the subject did not lie.	32	9

8. Discrimination The U.S. Supreme Court considered a case involving the exam for firefighter lieutenant in the city of New Haven, Connecticut. Results from the exam are shown in the table below. Is there sufficient evidence to support the claim that results from the test should be thrown out because they are discriminatory? Use a 0.01 significance level.

	Passed	Failed
White Candidates	17	16
Minority Candidates	9	25

9. Is Sentence Independent of Plea? Many people believe that criminals who plead guilty tend to get lighter sentences than those who are convicted in trials. The accompanying table summarizes randomly selected sample data for San Francisco defendants in burglary cases (based on data from "Does It Pay to Plead Guilty? Differential Sentencing and the Functioning of the Criminal Courts," by Brereton and Casper, *Law and Society Review*, Vol. 16, No. 1). All of the subjects had prior prison sentences. Use a 0.05 significance level to test the claim that the sentence (sent to prison or not sent to prison) is independent of the plea. If you were an attorney defending a guilty defendant, would these results suggest that you should encourage a guilty plea?

	Guilty Plea	Not Guilty Plea
Sent to Prison	392	58
Not Sent to Prison	564	14

10. Nurse a Serial Killer? Alert nurses at the Veteran's Affairs Medical Center in Northampton, Massachusetts, noticed an unusually high number of deaths at times when another nurse, Kristen Gilbert, was working. Those same nurses later noticed missing supplies of the drug epinephrine, which is a synthetic adrenaline that stimulates the heart. Kristen Gilbert was arrested and charged with four counts of murder and two counts of attempted murder. When seeking a grand jury indictment, prosecutors provided a key piece of evidence consisting of the table below. Use a 0.01 significance level to test the defense claim that deaths on shifts are independent of whether Gilbert was working. What does the result suggest about the guilt or innocence of Gilbert?

	Shifts with a Death	Shifts Without a Death
Gilbert Was Working	40	217
Gilbert Was Not Working	34	1350