Premedical course
MINITAB practical 7

1. In an investigation of the relationship between lung cancer and smoking the following table was produced:

	Smokers	Non-smokers
Lung-cancer patients	83	3
Control patients	72	14

Perform a χ^2 test on the table. The P-value found by applying Fisher's exact test to the table is 0.0088. Suggest why the χ^2 test gives a smaller P-value. Which would you report?

2. Patients with glomerulonephritis may present with one of 4 conditions: acute renal failure (ARF), asymptomatic proteinuria (AP), Nephrotic syndrome (NS), or recurrent haematuria (RH). In a retrospective study 100 patients were classified by mode of presentation and whether or not their kidneys were functional 2 years after presentation.

Five of the 32 with ARF, 17 of the 30 with AP, 16 of the 27 with NS and 10 of the 11 with RH had functional kidneys at 2 years. Present the data in tabular form and test the null hypothesis that the proportion with functional kidneys at two years is independent of mode of presentation. Interpret the result of the test.

3. The odds ratio for the 2 x 2 table

		Risk factor	
		+	-
Disease	+	a	b
	-	c	d

is $\hat{\psi} = ad / bc$. 95% confidence limits for $\hat{\psi}$ may be obtained through the formula for the standard error of $\log \hat{\psi}$ which is $\sqrt{1/a + 1/b + 1/c + 1/d}$.   Find 95% confidence limits for the odds of smokers having lung cancer relative to non-smokers using the data in the table of question 1.