

You have 70 minutes. You may use a calculator (scientific or graphing) and tables of z -, t -, and χ^2 -scores. Show work and explain answers. Use standard terminology. Don't forget to check all necessary conditions, before applying a technique.

P.S. This expression may be useful somehow:
$$\frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{1}{n_1-1} \left(\frac{s_1^2}{n_1}\right)^2 + \frac{1}{n_2-1} \left(\frac{s_2^2}{n_2}\right)^2}.$$

1. Radon is a radioactive gas that seeps into buildings from the surrounding soil. A radon information web site reports that 57% of homes in Rice County, Minnesota have unhealthy radon levels (4 picocuries per liter or higher). My radon testing technician tells me that of the 972 homes that she's tested around the county, 525 have had unhealthy radon levels. Is her experience consistent with the web site?

2. A study of fish consumption and prostate cancer occurrence in 6272 Swedish men yielded the following data. Is there an association between eating fish and prostate cancer?

Fish consumption	Had cancer	Had none
Negligible	14	110
Small	201	2420
Moderate	209	2769
Large	42	507

3. At an ice cream social, psychology researchers randomly gave people either a 17-ounce bowl or a 34-ounce bowl and invited them to scoop as much ice cream as they liked. Below are data on the amount of ice cream that people took. Did the bowl size affect the selected portion size?

Bowl size	Num. participants	Mean	Standard deviation
17	26	5.07	1.84
34	22	6.58	2.91

4. *Colin and Harvey, aspiring screen writers, are driving through Los Angeles.*

Harvey: Are you still looking to change jobs? My boss is looking for a new waiter, now that Anne has left to become an astronaut. It's an okay job. The tips are decent, I guess.

Colin: You know I hate driving that bus, but it pays the bills. I need \$2000 per month.

Harvey: In the seven months I've waited tables at this place, I've made \$1991, \$2284, \$2050, \$1970, \$2008, \$2077, and \$2114. You could do just as well as me.

Should Colin switch jobs? How risky is it?