

- A6 – 1.** Text Exercise 6.14 (page 450): *To assess the accuracy of a laboratory scale, a standard weight .....*
- A6 – 2.** Text Exercise 6.15 (page 450): *The 1990 census "long form" asked the total 1989 income of the householder, .....*  
[There is one careless piece of wording in this question; can you spot it?]
- A6 – 3.** (a) Text Exercise 6.73 (page 496): *Patients with chronic kidney failure may be treated by dialysis, .....*  
(b) Text Exercise 6.74 (page 496): *The normal range of phosphorus in the blood is considered to be .....*
- A6 – 4.** Text Exercise 6.79 (page 497): *In an investigation of possible iron deficiency in infants, researchers compared .....*
- A6 – 5.** Results of a 1984 public opinion poll in the U.S. showed that 51% of the respondents agreed completely with the statement: **The Soviets are just as afraid of nuclear war as we are, and therefore it is in our mutual interest to find ways to negotiate.** The article reporting the results of the survey stated that "*.... the findings are based on a telephone survey of 1,000 registered voters. .... The potential sampling error is plus or minus 3 percentage points.*"  
(a) Explain clearly but concisely how the figure of 3 percentage points was arrived at, and indicate its interpretation.  
(b) Does the survey justify the conclusion that a majority of registered voters agreed completely with the statement given above in **bold type**? Explain briefly.
- A6 – 6.** A brief report of a sample survey appeared in the *Brantford Expositor* on March 3, 1990, under the heading: *Copps gains on Chretien.* The report contained a common newspaper statement of survey precision: *The results, published in today's Halifax Chronicle-Herald, are based on 1,003 personal interviews conducted between Feb. 7-10 and are considered accurate within four percentage points, 19 times in 20.*  
(a) Show how the figure of 'four percentage points' is obtained and explain briefly what it means.  
(b) Would it be correct to say instead 'four percent'? Explain briefly.  
(c) In assessing the accuracy of the results of the poll, a student wrote: *The article does not say what economic class the respondents were from or how old they were, but it does not really have to because the poll is accurate and right 19 times in 20.* Comment.  
(d) The student also wrote: *The article does not tell us how many people refused the interview but it seems it does not matter – the people who were interviewed and their age and economic status must be positively correlated with regard to the final results because the poll is 'on the nose' 19 times in 20.* Comment.
- A6 – 7.** A psychologist speaking at a meeting of the Canadian Association of University Teachers said: "The evidence suggests that there is nearly correlation zero between teaching ability of a faculty member and his or her research productivity." The student newspaper reported this statement as: "Professor McDaniel said that good teachers tend to be poor researchers and good researchers tend to be poor teachers." Explain whether you consider the newspaper report to be an accurate one; if you do not, write a proper yet succinct account of what the speaker meant, using language suitable for a newspaper report.
- A6 – 8.** An investigation is undertaken in a certain city to answer the question as to whether a person's level of education has an effect on their willingness to vote. The city is divided into wards and, in each ward, the percentage in an equiprobably selected sample of adults with a completed high school education who vote is higher than the corresponding percentage for adults who did *not* complete high school.  
(a) Explain briefly whether the relationship found in each ward between level of education and willingness to vote necessarily holds for the city as a whole.  
(b) Assuming that the city has only *two* wards, make up data which illustrate your answer to (a).
- A6 – 9.** Text Exercise 3.1 (page 235): *A letter to the editor of Organic Gardening magazine (August, 1980) .....*
- A6 – 10.** Text Exercise 3.2 (pages 235-236): *When the discussion turns to the pros and cons of wearing automobile seat belts, .....*
- A6 – 11.** Text Exercise 3.3 (page 236): *There may be a "gender gap" in political party preference in the United States, .....*
- A6 – 12.** Text Exercise 3.5 (page 236): *What is the preferred treatment for breast cancer that is detected in its early .....*
- A6 – 13.** Text Exercise 3.20 (page 252-253): *The following investigations did not involve an experimental Plan. Could such a Plan be used .....*

**A6 - 14.** In a small investigation with an experimental Plan to address the question of the effect of cloud seeding on rainfall, resources were available to seed clouds on three days. It was therefore decided that, for the next six days on which conditions were favourable, three of the days chosen equiprobably would be seeded; the other three days would serve as controls.

SEEDED		CONTROL	
Day	Rainfall	Day	Rainfall
1	1.3	2	0
4	1.7	3	0
5	2.3	6	1.2

- (a) Describe briefly a method for equiprobably assigning the three days for seeding.
- (b) Explain briefly why probability assigning is necessary in this situation.
- (c) The results of the investigation were the *amount* of rainfall (in mm) on each day at the local weather station; these amounts were as shown in the table at the right above.
  - (i) Assuming that seeding had *no effect* on rainfall, make an ordered list of the 20 possible *differences* in average rainfall (average of 3 seeded days – average of 3 control days).
  - (ii) What Answer can be given about the difference in average rainfall *actually observed*, in light of where it falls in your list in (i); indicate the consequence(s) of the equiprobable assigning for your Answer.

**A6 – 15.** Text Exercise 3.80 (page 284): *An investigation of the effects of running on personality involved 231 male runners .....*

**A6 – 16.** Comment *critically but briefly* on each of the following three statements.

- (a) People take a greater risk with their lives when they dine than when they travel by air or play with a loaded gun, says an authoritative British medical weekly. The *Lancet* says that 3,000 people choke to death in the United States each year and, in terms of total deaths, this makes 'dining more hazardous than flying or playing with a loaded gun.'
- (b) To say that an unwanted pregnancy leads to a case of child abuse is unrealistic. Studies have shown that 90% of all battered children are the results of planned pregnancies.
- (c) In 1964, the U.S. Public Health Service studied the effects of smoking on health in a sample of 42,000 households. For men and women in each age group, they found that those who never smoked were, on average, somewhat healthier than current smokers, but the current smokers were much healthier than the former smokers. The lesson seems to be that you shouldn't smoke but, once you have started, don't stop.

**\*A6 – 17.** In the article given below entitled '**Positive success**,' comment (in *not more than 200 words*) on the statement: *Huron rabies vaccine experiment labelled a major breakthrough* in light of the information given in the article.

**Kitchener-Waterloo Record, January 7, 1987, page A4**

# 'Positive success'

## Huron rabies vaccine experiment labelled a major breakthrough

**By Philip Bast**  
Record staff

Preliminary results of a vaccine test on foxes in Huron County indicate a major breakthrough in efforts to reduce rabies in Ontario.

Last September slightly more than 15,000 plastic bags containing bait spiked with a rabies vaccine were dropped from an airplane over wooded areas near Goderich.

Hunters and trappers in the area, who have been involved in the tests for several years, sent parts of fox carcasses to special labs for analysis to determine whether the bait was eaten and whether the vaccine succeeded.

The "live virus" vaccine used this fall was slightly stronger than the low-strength version used the previous year and it seems to be working.

"We had our first positive success." Charles MacInnes of the Ministry of Natural Resources' wildlife department, said in an interview.

During the past three months, 101 fox specimens have been received from trappers. Fifty-four per cent of the foxes had eaten the bait, and 40 per cent of those that ate the bait "had good antibody levels," which means "we have a vaccine that's working!" MacInnes said.

The Goderich-area field test was part of a rabies research project started in 1979 to find a suitable oral vaccine for foxes. Ontario has been the rabies capital of North America since the 1950s.

The province's advisory committee on rabies includes Ministry of Natural Resources officials, federal animal disease researchers in Ottawa, and scientists from several universities and private laboratories across

Ontario.

MacInnes said the success of the vaccine test program will likely lead to a "dress rehearsal" of a rabies control program by the fall of 1988. More bait would be dropped over a larger area, likely in Eastern Ontario where the rabies cycle appears more regular, making it easier to predict a resurgence in the disease.

If the program works on a widespread basis as well as it seems to have worked in the Huron test last fall, MacInnes said, "I would guess that we'll be able to reduce rabies to less than 10 per cent of the level it's at now!"

That's the kind of success being observed in a similar program throughout western Europe, where a slightly different bait is placed in the forrests rather than being dropped from planes, MacInnes said.