

Review Problems for Chapters 14-22

1. In a combined study of northern pike, cutthroat trout, rainbow trout, and lake trout, it was found that 26 out of 855 fish died when caught and released using barbless hooks on flies or lures. All hooks were removed from the fish.

  - (a) Find a 99% confidence interval for  $p$ .
  - (b) Carry out a hypothesis test to see if there is sufficient evidence that the percentage of fish that died was less than 5%. Use  $\alpha = 0.05$ .
2. When measuring the amount that farmers earn for their watermelon crops, a random sample of 40 farming regions gave a sample mean of \$6.88 per hundred pounds of watermelon. Assume that the population standard deviation is \$1.92 per 100 pounds.

  - (a) Is there sufficient evidence to show that farmers earn less than \$7 per hundred pounds of watermelon? Use  $\alpha = 0.02$ .
  - (b) Find a 98% confidence interval for the population mean price that farmers get for their watermelon crop.
  - (c) What sample size is needed to estimate the mean to within  $\pm 0.5$  with 98% confidence?

3. The following table shows ceremonial ranking and type of pottery jar sherd for a random sample of 434 sherds at a location in the Sand Canyon Archaeological Project, Colorado.

Ceremonial Ranking	Cooking Jar Sherds	Decorated Jar Sherds
A	86	49
B	92	53
C	79	75

Is there a relationship between the ceremonial ranking and the pottery type? Use  $\alpha = 0.05$ .

4. The weights (in lbs) of 5 pro football players are:

245 262 255 251 244

The weights (in lbs) of 4 pro basketball players are:

205 200 220 210

- (a) Find a 95% confidence interval for the difference in weights.
- (b) Is there sufficient evidence that pro football players are heavier than pro basketball players? Use  $\alpha = 0.01$

5. Adult mountain lions captured and released for the first time in the San Andres Mountains gave the following weights (pounds):

68 104 128 122 60 64

- (a) Is there sufficient evidence to show that the average weight of all mountain lions is different from 100 pounds? Use  $\alpha = 0.1$ .
- (b) Find a 96% confidence interval for the population mean weight of all mountain lions.
6. Most married couples have two or three personality preferences in common. Myers used a random sample of 375 married couples and found that 132 had three preferences in common. Another random sample of 571 couples showed that 217 had two personality preferences in common.
- (a) Find a 90% confidence interval for the difference in proportions.
- (b) Is there sufficient evidence to conclude that more married couples have two personality preferences in common than three preferences? Use  $\alpha = 0.025$ .