

Honors Statistics 8.2 & 8.3 Practice Quiz (assume normally distributed)

1. In a survey of 5,800 12th grade males, 1,580 said they had smoked in the last 30 days. In a survey of 6,600 12th grade females, 1,683 said they had smoked in the last 30 days. At $\alpha = 0.01$, test the claim that the proportion of 12th grade males who said they had smoked in the last 30 days is more than the proportion of twelfth grade females. Use the p-value method.

2. A study was conducted in 1991 and then again in 2014 asking people if they had used alternative medicines. Construct a 90% confidence interval to determine if there is a difference between the proportion of adults using alternative medicines in 1991 and 2014.

1991 study $x = 520$ $n = 1539$

2014 study $x = 865$ $n = 2055$

3. Crash tests at 5 mph were performed on small utility vehicles and small pickups and the estimated repair costs were calculated. At $\alpha = 0.10$, test the claim that the mean bumper repair cost is less for small utility vehicles than for small pickups. Use the traditional method.

Small utility vehicles: $\bar{x} = \$485$ $s = 382$ $n = 8$

Small pickups: $\bar{x} = \$1090$ $s = 403$ $n = 5$

4. A medical group studied the ailments of adults with diabetes. Of 8750 adults who are diabetic, 2100 have high cholesterol. Of 7250 adults who are not diabetic, 1482 have high cholesterol. At $\alpha = 0.05$, test the claim that the proportion of adults who have high cholesterol is the same for the two groups. Use the traditional method.

5. A study of fast food nutrition compared the caloric content of French fries. Twenty five randomly selected servings of Burger King medium French fries had a mean of 360 calories and a standard deviation of 50 calories, and 20 randomly selected servings of Wendy's medium French fries had a mean of 390 calories and a standard deviation of 45 calories. Construct a 99% confidence interval to determine if the caloric content of the two French fries are different.

Answers

1) Right tail; $z = 2.197$; $p\text{-value} = 0.0140$; fail to reject null; Males who smoked not more than females

2) $(-0.1098, -0.0563)$; There is a difference between how many people used alternative medicine in 1991 and 2014. Zero is not in the confidence interval.

3) Left tail; $T_{cv} = -1.533$; $t = -2.686$; reject null; The costs of repair for small utility vehicles is less than repairs for small pickups.

4) Two tail; $Z_{cv} = +/- 1.96$; $z = 5.376$; reject null; the proportions of diabetics and diabetics that have high cholesterol are different.

5) $(-68.26, 8.26)$; There is no difference between caloric content for the two types of French fries. Zero is in the confidence interval.