ACSTA 101: Section 7.2 Practice Problems

(1) Employees at a construction and mining company claim that the mean salary of the company's mechanical engineers is less than that of one of its competitors, which is $88,200. A random sample of 20 of the company's mechanical engineers has a mean salary of $85,900. Assume the population standard deviation is $9500 and the population is normally distributed. At $\alpha = 0.05$, test the employees' claim.

(2) A researcher claims that the mean annual cost of raising a child (age 2 and under) by married-couple families in the U.S. is $14,050. In a random sample of married-couple families in the U.S., the mean annual cost of raising a child (age 2 and under) is $13,795. The sample consists of 500 children. Assume the population standard deviation is $2875. At $\alpha = 0.10$, is there enough evidence to reject the claim?

(3) A CEO of a company claims that the mean workday of the company's mechanical engineers is less than 8.5 hours. A random sample of 25 of the company's mechanical engineers has a mean workday of 8.2 hours. Assume the population standard deviation is 0.5 hour and the population is normally distributed. At $\alpha = 0.01$, test the CEO's claim.

(4) A fast food restaurant estimates that the mean sodium content in one of its breakfast sandwiches is no more than 920 milligrams. A random sample of 44 breakfast sandwiches has a mean sodium content of 925 milligrams. Assume the population standard deviation is 18 milligrams. At $\alpha = 0.1$, do you have enough evidence to reject the restaurant's claim?