Name:_____   Math 130
Date: 4/17/2025   Quiz 13

Some formulas you may need:

$$t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}} \qquad df = n-1 \qquad s = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}} = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}}$$

1. (10 points) **Agriculture: Groundwater** Unfortunately, arsenic occurs naturally in some groundwater. A mean arsenic level less than 8.0 parts per billion (ppb) is considered safe for agricultural use. A well in Texas is used to water crops. This well is tested on a regular basis for arsenic. A sample of 8 tests of this well lead to the arsenic levels in the table below.

Arsenic Level (ppb)

7.7	8.1	7.9	8.2
8.1	7.8	7.9	7.6

Does the data indicate that the level of arsenic in this well is safe for agricultural use at the 0.01 significance level?

1. (3 points) What does the 0.01 mean when a hypothesis test is performed at the 0.01 significance level?

2. (1 point) What is a type I error?

3. (1 point) What is a type II error?