# Question 3

An industrial plant dumps its waste into a nearby river, but claims that it is not impacting the native species of frogs that live in the river. The frogs are able to tolerate calcium concentrations **up to 91 mg/L**.

You measure the concentration of calcium in 25 random samples from the river. Your measurements are approximately normally distributed, with a **mean of 93.6 mg/L**, with a standard deviation of **7.8 mg/L**.

(1/1 point)

3a. What is the appropriate **alternative hypothesis** if the industrial plant's runoff is believed to be producing higher calcium concentrations than are deemed acceptable for the frogs? *Let $\mu$ represent the true calcium concentration in the river downstream from the plant.*

- $\mu = 91$
- $\mu \neq 91$
- $\mu < 91$
- $\mu > 91$ ✔

*You have used 1 of 1 submissions*

Lab due May 03, 2016 at 17:00 UTC

**Problem Set**
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(1/1 point)
3b. Calculate the **test statistic**. *(Round to 2 decimal places.)*

1.67 ✔ **Answer:** 1.67

1.67

*You have used 1 of 1 submissions*

(1/1 point)
3c. What is the **t-critical** value? Assume an alpha level of .05.*(Round to 3 decimal places.)*

1.711 ✔ **Answer:** 1.711

1.711

*You have used 1 of 1 submissions*

(1/1 point)
3d. Does your data provide sufficient evidence to suggest that the calcium concentration in the river is **more than** 91 mg/L?

- Yes
- No ✔

*You have used 1 of 1 submissions*

(1/1 point)
3e. Suppose as part of a broader investigation into the plant's impact on the river's ecosystem, an environmental group conducted a large-scale study and found that the actual mean calcium concentration level downstream from the plant is 95 mg/L. Did you make an error in your hypothesis test, and if so, what type was it?

- Yes, a Type I Error

- (•) Yes, a Type II Error ✔
- ( ) No error was made

*You have used 1 of 1 submissions*