

[Courseware](#) [Course Info](#) [Discussion](#) [Syllabus](#) [Download R and RStudio](#) [R Tutorials](#) [Readings](#) [Contact Us](#)

[Progress](#) [Office Hours](#) [Community](#)

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 point possible)

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 μ represent the true calcium concentration in the river downstream from the plant.

☐ $\mu = 91$

☐ $\mu \neq 91$

☐ $\mu < 91$

☐ $\mu > 91$



Hide Answer

You have used 0 of 1 submissions

(1 point possible)

3b. Calculate the **test statistic**. (Round to 2 decimal places.)

Answer: 1.67

Hide Answer

You have used 0 of 1 submissions

Help

(1 point possible)

3c. What is the **t-critical** value? (Round to 3 decimal places.)

Help

Answer: 1.711

Hide Answer

You have used 0 of 1 submissions

(1 point possible)

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

☐ Yes

☒ No



Hide Answer

You have used 0 of 1 submissions

(1 point possible)

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

Help

[Hide Answer](#)*You have used 0 of 1 submissions*

EdX offers interactive online classes and MOOCs from the world's best universities. Online courses from MITx, HarvardX, BerkeleyX, UTx and many other universities. Topics include biology, business, chemistry, computer science, economics, finance, electronics, engineering, food and nutrition, history, humanities, law, literature, math, medicine, music, philosophy, physics, science, statistics and more. EdX is a non-profit online initiative created by founding partners Harvard and MIT.

trademarks or trademarks of edX Inc.
Question 3 | Problem Set | UT.7.01x Courseware | edX

Terms of Service and Honor Code

Privacy Policy (Revised 10/22/2014)

Help

About edX

About

News

Contact

FAQ

edX Blog

Donate to edX

Jobs at edX

<https://courses.edx.org/courses/UTAustinX/UT.7.01x/3T2014/courseware/9ff7c...>

Follow Us



Twitter



Facebook



Meetup



LinkedIn



Google+