Extra Practice

H₀: B = 0
Hₐ: B < 0

B = true slope of the population regression line relating swim time and pulse rate.

Linear: The scatterplot is roughly linear.

Independent: Must assume that 23 is less than 10% of the total number of days that the professor swims.

Normal: The distribution of the residuals, as evidenced by the histogram, is relatively Normal.

Equal Variance: The residual plot shows roughly equal distribution of positive and negative residuals, which means there is relatively equal variance.

Random: Random sample, as stated.

All conditions for a T-Test Linear Regression are met.

T = -5.13, df = 21, p-value = 0.000

Since the p-value is less than α = 0.01 we reject the null hypothesis. We have convincing evidence that there is a negative relationship between swim time and pulse.
Sample size $\rightarrow 23$

$df = 21$

$t^* = 2.08$

$-9.695 \pm 2.08(1.889) = (-13.624 \text{ to } -5.766)$

We are 95% confident that the interval from $-13.624 \text{ to } -5.766$ captures the true slope of the population regression line for predicting pulse rate from swim time.