

You have 30 minutes. Take your time!

Note that this sheet has **two sides**.

Name: A. Student

ONE (1 mark): In Assignment 05 you used a one-way ANOVA and the post-hoc LSD test to analyze experimental data on the effect of nitrogen fertilizer on stand basal area increment.

(a) What were the specific hypotheses for the ANOVA?

Ho:	$\sigma_{TR}^2 / \sigma_E^2 = 1$
Ha:	$\sigma_{TR}^2 / \sigma_E^2 > 1$

(b) Give an example pair of hypotheses for an LSD test.

Ho:	$\mu_1 - \mu_2 = 0$
Ha:	$\mu_1 - \mu_2 \neq 0$

TWO (3 marks): Definitions

1. We can use simple Pearson correlation analysis to examine the relationship between two variables. What are the following symbols called in correlation analysis?

a) ρ is the population correlation

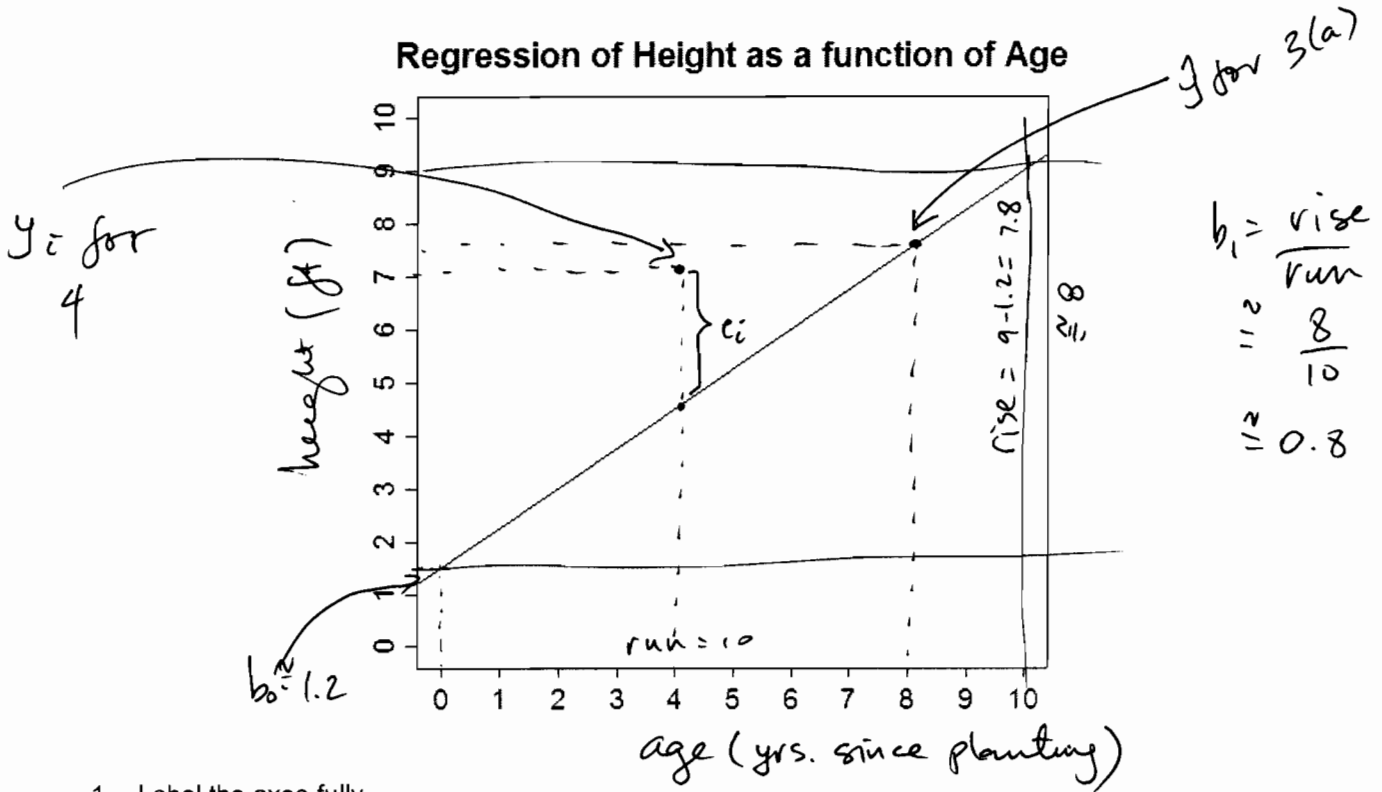
b) r is the sample correlation

c) r^2 is the coefficient of determination

2. Briefly describe r^2 and what it tells you about the two variables.

It is a measure of the proportion of variation in one variable explained by variation in the other variable

THREE (6 marks): A simple linear regression analysis was performed on data collected from young Red Pine stands. These stands were all planted with trees that were three years old at the time of planting. Height (in feet) and age (in years since planting) were measured on 75 trees. Below is a plot of the regression line.



1. Label the axes fully.
2. What are the estimates for the slope and intercept, approximately? Write the equation for the line including these values.

$$\hat{y} = 1.2 + 0.8 \cdot \text{age}$$

3. (a) What is the predicted height for an 8-year-old tree, approximately? (b) Plot and label the point on the figure.

$$7.5 \text{ ft}$$

4. One of the observations in the fitting data was a tree with age 4 years and height 7 feet. (a) Plot and label this point; (b) calculate the residual for this point; and (c) draw a representation of the residual on the figure, and label it.

$$e_i = 7 - 4.5 = 2.5 \text{ ft.}$$