

You have 30 minutes. Take your time!
 Note that this sheet has **two sides**.

Name: A. Student

ONE: What's the difference between regression analysis and correlation analysis?

in regression, we believe there's a causal relationship between x and y

in correlation, we measure association without implying predictor & response

TWO: Reproduced below is a worked example of a statistical test that I demonstrated in detail in class.

	A	B	C	D	E	F
1	OBSERVED	choked	weeds	shingle	silt	margin_tot
2	slow	10	8	2	7	27
3	fast	2	6	10	5	23
4	margin_tot	12	14	12	12	50
5						
6	EXPECTED	choked	weeds	shingle	silt	margin_tot
7	slow	6.48	7.56	6.48	6.48	27
8	fast	5.52	6.44	5.52	5.52	23
9	margin_tot	12	14	12	12	50
10						
11	(O-E) ² /E	choked	weeds	shingle	silt	
12	slow	1.91209877	0.02560847	3.09728395	0.0417284	
13	fast	2.24463768	0.03006211	3.63594203	0.04898551	
14				=SUM(B12:E13)		11.0363469
15				=CHIINV(0.05,(2-1)*(4-1))		7.81472776
16				=CHIDIST(F14,3)		0.01153095

1. What was the objective of this test?

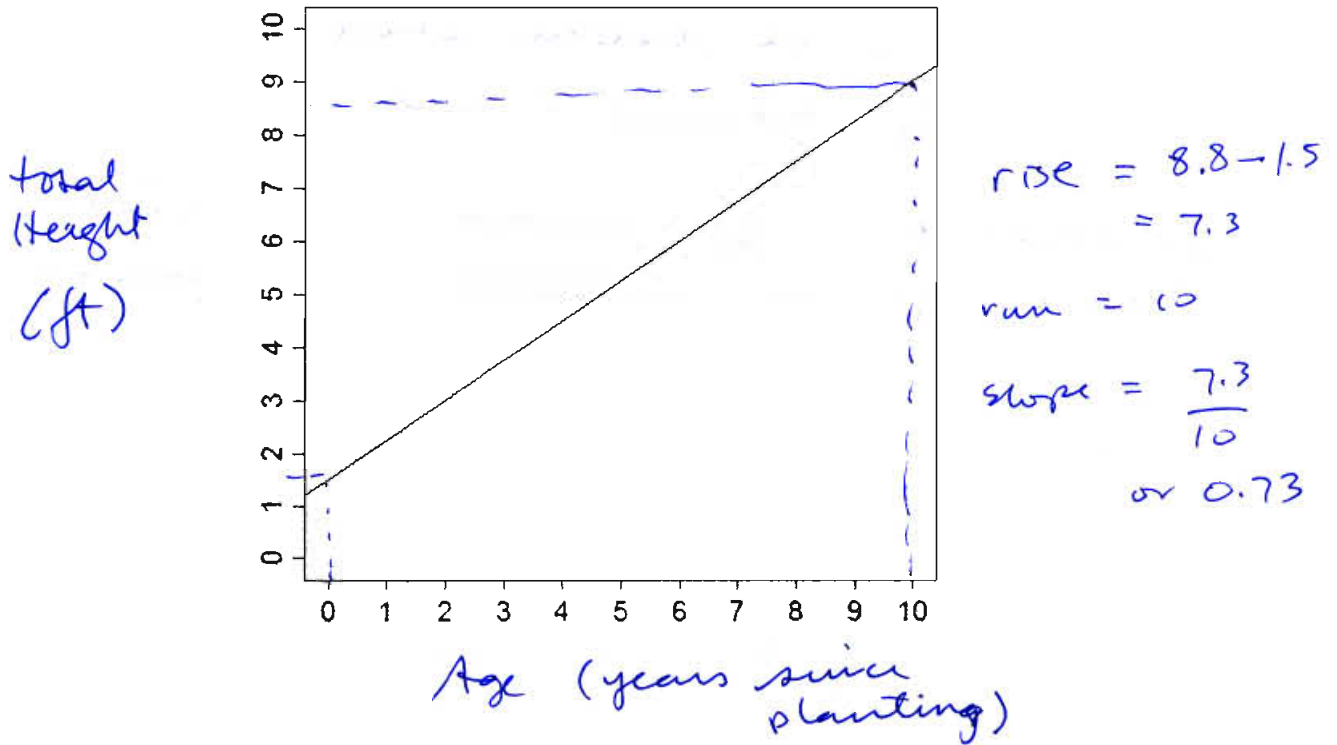
The objective was to determine whether stream velocity and substrate categories were associated.

2. What was the conclusion of this test?

Since $p < \alpha$ (or $\chi^2\text{-calc} > \chi^2\text{crit}$) we reject H_0 : no relationship and accept H_a : the two factors are associated.

THREE: 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. Total height (in feet) and age (in years since planting) were measured on 75 trees. Below is a plot of the fitted regression line.

Regression of Height as a function of Age



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.

$$b_1 = 0.73$$

$$b_0 = 1.5$$

$$\hat{y} = 1.5 + 0.73 \cdot \text{Age}$$

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

$$\hat{y} = 1.5 + 0.73 \cdot 8$$

$$\hat{y} = 1.5 + 5.84$$

$$\hat{y} = 7.34 \text{ ft}$$

$$\begin{array}{r} 2 \\ 73 \\ \hline 8 \\ \hline 5.84 \end{array}$$