

EQ: How do you determine if there is a **significant relationship** between **Y** and **X** in a **LSRL**?

❖ RECALL SOME (REALLY) OLD STUFF: p. 894 #1

- Calculate the LSRL for Humerus length vs Femur length and write it in context.

_____ = _____

- Interpret the slope in context. _____

- Interpret the correlation coefficient in context. _____

- Interpret the coefficient of determination in context. _____

- Calculate and graph the residuals. Using the residuals, the scatterplot, and the regression analysis, discuss whether you think this linear model is a good fit for this data set.

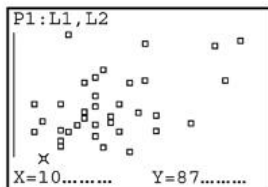
RECALL: _____ STATISTIC _____ PARAMETER _____

True-Regression Line --- _____

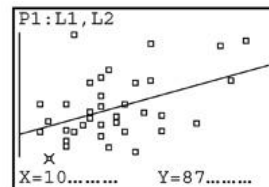
On average, there is a _____ between _____ and _____. The _____ response, _____ moves along a straight line as _____ varies.

RECALL: _____ STATISTIC _____ PARAMETER _____

➤ See Ex 1 p. 890



```
LinReg
y=a+bx
a=91.26829865
b=1.492896598
r2=.2069999897
r=.4549725153
```



Based on this output, what are some statements you can make about the relationship between predicted IQ at three years of age and intensity of their crying as infants?

➤ **RECALL:** **Reading Computer Printout** Refer to p. 895 #2

Predictor	Coef	Stdev	t-ratio	p
Constant	11.547	5.600	2.06	0.056
armspan	0.84042	0.0809	10.39	0.000

s = 1.613 R-sq = 87.1% R-sq(adj) = 86.3%

1. Write the LSRL in context.

_____ = _____

2. What is your estimate of β for the true regression line from the data? Interpret in context of the problem.

3. What is your estimate of the intercept α for the true regression line from the data? Interpret in context of the problem.

4. Verify the formula $t = \frac{b}{SE_b}$ using this output.

5. Do you think the LSRL is an appropriate model for the data? Justify using information provided. Would you be willing to predict a student's height using this model if you knew his arm span was 76 inches?

In class Example. The following output was created from 77 data samples pairing number of grams of sugar in a cereal with its nutritional rating. Use this output to answer these questions.

Predictor	Coef	StDev	T	P
Constant	59.284	1.948	30.43	0.000
Sugars	-2.4008	0.2373	?	?

S = 9.196 R-Sq = 57.7% R-Sq(adj) = 57.1%

1. What is your estimate for the slope of the true regression line?

2. What is your estimate for the intercept of the true regression line?

3. Calculate the missing values. $t =$

NOTE: df for Inference for Regression is $df =$ _____

Use $tcdf$ (_____, _____, _____) to calculate the _____

$tcdf$ (_____, _____, _____) $P(t \quad) =$ _____

In Class Ex 2:

Regression Equation:

$S =$ _____ $SE_b =$ _____

$df = n - 2 =$ _____ therefore $n =$ _____

Computer Output Example: Age & Range of Motion (POD 5.11)

Predictor	Coef	StDev	T	P	
Constant	107.58	11.12	9.67	0.000	
Age	0.8710	0.4146	2.10	0.062	
S = 10.42 R-Sq = 30.6% R-Sq(adj)=23.7%					
Analysis of Variance					
Source	DF	SS	MS	F	P
Regression	1	479.2	479.2	4.41	0.062
Residual Error	10	1085.7	108.6		
Total	11	1564.9			

❖ Estimating the slope β of the true regression line:

Confidence Interval Formula: _____

Ex 3 Find a 90% confidence interval for the slope of the true regression line for #2 from p. 894.

Ex 4 Find a 95% confidence interval for the slope of the true regression line for the age and range of motion problem.

Conditions for Inference for Regression:

1. Observations are _____.
2. The true relationship is _____.
3. The _____ of the response about the line is _____.
4. Check for _____.

❖ On AP STAT Exam, you will only need to _____ these four conditions.

➤ Assignment p. 901 #8, 9