AP Statistics Name:

Sarah's parents are concerned that she seems short for her age. Their doctor has recorded Sarah's age and height on six consecutive office visits. These data were entered into a Minitab worksheet, and Sarah's height was regressed on her age. Here is part of the computer output:

Predictor	Coef	Stdev	t-ratio	p
Constant	71.950	1.053	*	*
Age	0.38333	0.02041	*	*

s = 0.3873 R-sq = 98.9% R-sq(adj) = 98.6%

1. Suppose we want to conduct a test to determine whether Sarah's age is useful in predicting her height. Write appropriate null and alternative hypotheses for such a test.

2. What is the equation of the least-squares regression line?

3. The t statistic for testing H_0 has been left out. Use the output to find t.

4. How many degrees of freedom does t have?

5. Use your TI-83 and the answers to the previous parts to approximate the P-value of t against H_a.

6. Write your conclusions in plain language.

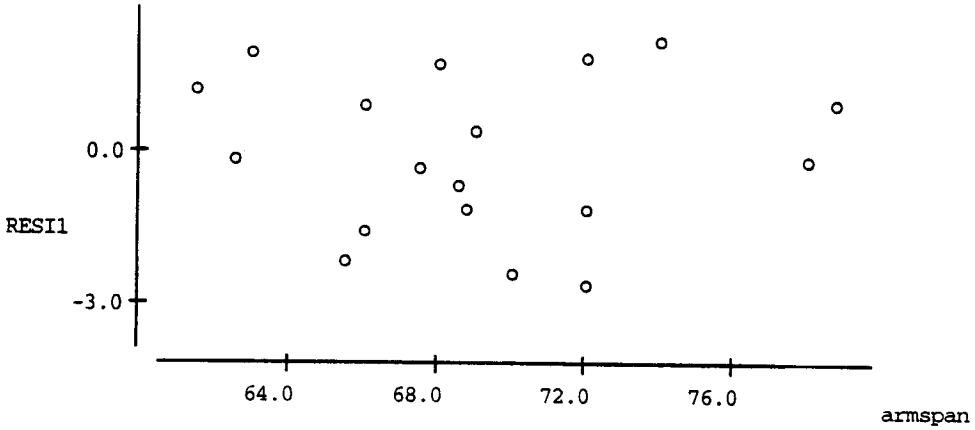
7. Construct a 95% confidence interval for the population regression slope.

Ideal proportions Once upon a time, a class like yours made measurements of their arm span and height. They entered their results into a Minitab worksheet, requested least squares regression of height on arm span (both in inches) and obtained the following output:

Predictor	Coef	Stdev	t-ratio	p
Constant	11.547	5.600	2.06	0.056
Arm span	0.84042	0.08091	10.39	0.000

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

A residual plot for the data looks like this:



1. Determine the equation of the least squares regression line from the printout.

2. In your opinion, is the least squares line an appropriate model for the data? Would you be willing to predict a student's height, knowing that his arm span is 76 inches? Explain. Then do it – use this model to predict the height of a student whose arm span is 76 inches.

3. Estimate the parameters α, β, and σ.

4. Construct a 95% confidence interval for the true slope of the regression line.