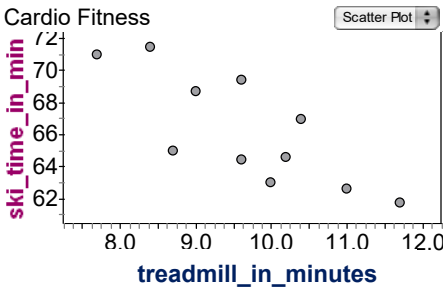
AP Statistics – Computer Output Name: KEY (NOTES) Per: ∞

1. **Study this information carefully.**
Is cardiovascular fitness (as measured by time to exhaustion running on a treadmill) related to an athlete's performance in a 20-km ski race?



x = treadmill run time to exhaustion (min)
y = 20-km ski time (min)

Predictor	Coef	StDev	T	P
Constant	88.796	5.750	15.44	0.000
treadmill	-2.3355	0.5911	-3.95	0.003

S = 2.188 R-Sq = 63.04% R-Sq (adj) = 59.3%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	74.630	74.630	15.58	0.003
Residual Error	9	43.097	4.789		
Total	10	117.727			

A) What is the slope for the regression equation? -2.3355 y-intercept? 88.796

B) Write the regression equation (LSRL) in context.
predicted ski time = 88.796 – 2.3355(treadmill time)

C) Interpret the slope in context.
For each increase of 1 minute in treadmill time,
the model predicts a decrease of 2.3355 minutes in ski time.

2. It is certainly plausible that workers are less likely to quit their jobs when wages are high than when they are low. Let x = average hourly wage and y = quit rate (number of employees per 100 who left jobs during 1996.) The scatterplot of the data has a linear form.

Predictor	Coef	Stdev	t-ratio	p
Coefficient	4.8615	0.5201	9.35	0.000
wage	-0.3466	0.0587	-5.91	0.000

s = 0.4862 R-sq = 72.9% R-sq(adj) = 70.8%

A) What is the slope for the regression equation? -0.3466 y-intercept? 4.8615

B) Write the regression equation in context.
predicted quit rate = 4.8615 – 0.3466(average hourly wage)

C) Interpret the slope in context.
For each increase of 1 "unit" in average hourly wage,
we predict a decrease of 0.3466 in employee quit rate.

D) What is the correlation coefficient? Interpret in context.
r = -0.854
There is a fairly strong, negative, association between average hourly wage and quit rate.

E) Interpret R-sq in context.
72.9% of the variability in quit rate can be explained by the linear model
for average hourly wage and quit rate.

F) Interpret s_e in context.
0.4862 is the typical amount that the predicted quit rate deviates from the actual (observed) quit rate.

3. Hand span is the distance from the tip of a person's little finger to the tip of their thumb when the hand is spread out to its fullest. Researchers gathered data in order to predict a person's left hand span using their right hand span. The scatterplot of the data has a linear form. This is a computer output of their findings.

Dependent variable: Left hand span

Predictor	Coef	SECoef	T	P
RtSpan	0.9383	0.0225	41.67	0.000
Constant	1.4365	0.4792	3.05	0.003

s = 0.6386 R-sq = 90.2% R-sq (adj) = 90.2%

A) What is the slope for the regression equation? 0.9383 y-intercept? 1.4365

B) Write the regression equation in context.
predicted left hand span = 1.4365 + 0.9383(right hand span)

C) Interpret the slope in context.
For each increase of 1 "unit" in right hand span, we predict an increase of 0.9383 "units" in left hand span.

D) What is the correlation coefficient? Interpret in context.
r = 0.9497
There is a very strong, positive, association between right hand span and left hand span.

E) Interpret R-sq in context.
90.2% of the variability in left hand span can be explained by the linear model for right hand span and left hand span.

F) Interpret s_e in context.
0.6386 "units" is the typical amount that the predicted left hand span deviates from the actual left hand span.

4. The difference in average age (men's age – women's age) at first marriage is plotted for the years 1975 to 1998. The scatterplot of the data appears fairly linear. Computer output:

Dependent variable: Men – Women

Variable	Coef	SE(Coef)	t-ratio	p-value
Intercept	49.0021	10.93	4.56	0.0002
Year	-0.0239	0.0055	-4.35	0.0003

s = 0.1866 R-sq = 46.3% R-sq (adj) = 46.1%

A) What is the slope for the regression equation? -0.0239 y-intercept? 49.0021

B) Write the regression equation in context.
predicted age difference of men - women = 49.0021 – 0.0239(year)

C) Interpret the slope in context.
For each increase of 1 year, we predict a decrease of 0.0239 in the average age difference of men's age – women's age at first marriage.

D) What is the correlation coefficient? Interpret in context.
r = -0.680
There is a moderate, negative, association between year and average age difference of men's age – women's age at first marriage.

E) Interpret R-sq in context.
46.3% of the variability in average age difference of men's age – women's age can be explained by the linear model for year and average age difference of men's age – women's age.

F) Interpret s_e in context.
0.1866 is the typical amount that the predicted average age difference deviates from the actual average age difference between men and women at first marriage.