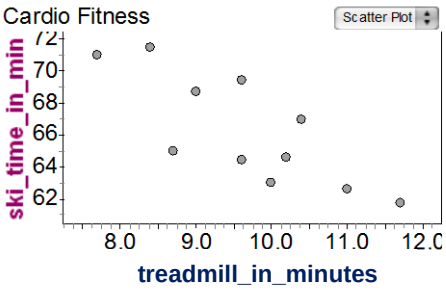
AP Statistics – Computer Output Name: _____ Per: ____

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. 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.

3. 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.