1.(1 pt)

Use a scatterplot and the linear correlation coefficient r to determine whether there is a correlation between the two variables.

x	0.7	1.3	2.6	3.6	4.6	5.6	6.6	7.7	8.1	9	10.4	11.1	12.1	13.1	14.8
y	12.3	10.3	6.4	4.1	2.2	1	0.2	0	0.1	0.6	2.2	3.5	5.6	8.4	14.2

$r =$ ______

There is

- A. a positive correlation between x and y
- B. a perfect negative correlation between x and y
- C. a negative correlation between x and y
- D. a nonlinear correlation between x and y
- E. a perfect positive correlation between x and y
- F. no correlation between x and y

2.(1 pt) Match the following sample correlation coefficients with the explaination of what that correlation coeffiecient means.

__ 1. $r = -1$
__ 2. $r = -.97$
__ 3. $r = 0$
__ 4. $r = -.15$

A. a weak negative relationship between x and y
B. a strong negative relationship between x and y
C. no relationship between x and$y$
D. a perfect negative relationship between x and y

3.(1 pt) Given the following data set,

x	-1	1	2	-2	1	-2	0
y	2	6	0	2	1	2	2

Compute the coefficient of correlation r
$r =$ ______

4.(1 pt) Heights (in centimeters) and weights (in kilograms) of 7 supermodels are given below. Find the regression equation, letting the first variable be the independent (x) variable, and predict the weight of a supermodel who is 175 cm tall.

Height	172	176	178	176	178	174	168
Weight	52	56	58	54	57	54	50

The regression equation is $y =$ ______ $+$ ______ x.
The best predicted weight of a supermodel who is 175 cm tall is ______ .

5.(1 pt) Is the number of games won by a major league baseball team in a season related to the team batting average? The table below shows the number of games won and the batting average of 8 teams.

Team	Games Won	Batting Average
1	107	0.262
2	83	0.276
3	98	0.268
4	60	0.264
5	77	0.29
6	84	0.281
7	95	0.267
8	109	0.286

Using games won as the independent variable x, do the following:
(a) The correlation coefficient is
$r =$ ______
(b) The equation of the least squares line is
$y =$ ______ $+$ ______ x

6.(1 pt) The amounts of 6 restaurant bills and the corresponding amounts of the tips are given in the below.

Bill	88.01	106.27	32.98	70.29	97.34	64.30
Tip	10.00	16.00	4.50	10.00	16.00	7.70

Use a 0.05 confidence level to find the following:
The test statistic $r =$ ______
Is there a significant correlation?

- A. No
- B. Yes

The regression equation is $\hat{y} =$ ______ $+$ ______ x.
If the amount of the bill is \$100, the best prediction for the amount of the tip is ______

7.(1 pt) The amounts of 6 restaurant bills and the corresponding amounts of the tips are given in the below.

Bill	106.27	32.98	64.30	49.72	88.01	43.58
Tip	16.00	4.50	7.70	5.28	10.00	5.50

Use a 0.05 confidence level to find the following:

The test statistic $r =$ ______
The test statistic $t =$ ______
The critical value $t =$ ______
Is there a significant correlation?

- A. Yes
- B. No

The regression equation is $\hat{y} =$ ______ + ______ x.

If the amount of the bill is \$40, the best prediction for the amount of the tip is ______ , and a prediction interval estimate of the amount amount of the tip is ______ < tip < ______

8.(1 pt) Construct both a 95% and a 99% confidence interval for β_1.
$\hat{\beta}_1 = 49,\ s = 7.9,\ SS_{xx} = 62,\ n = 21$
95% : ______ $\leq \beta_1 \leq$ ______
99% : ______ $\leq \beta_1 \leq$ ______

9.(1 pt) Find the multiple regression equation for the data given below.

x_1	−3	−2	−1	2	2
x_2	−4	1	0	−2	3
y	6	−17	−6	16	−11

The equation is $\hat{y} =$ ______ + ______ $x_1 +$ ______ x_2.

10.(1 pt) Consider the data set below.

x	6	2	5	8	9	9
y	5	2	1	9	8	7

For a hyopthesis test, where $H_0 : \beta_1 = 0$ and $H_1 : \beta_1 \neq 0$, and using $\alpha = 0.05$, give the following:
(a) The test statistic
$t =$ ______
(b) The degree of freedom
$df =$ ______
(c) The rejection region
$|t| >$ ______
The final conclustion is

- A. There is not sufficient evidence to reject the null hypothesis that $\beta_1 = 0$.
- B. We can reject the null hypothesis that $\beta_1 = 0$ and accept that $\beta_1 \neq 0$.

11.(1 pt) In some cases, the best-fitting multiple regression equation is of the form $\hat{y} = b_0 + b_1 x + b_2 x^2 + b_3 x^3$. The graph of such an equation is called a cubic. Using the data set given below, and letting $x_1 = x$, $x_2 = x^2$, and $x_3 = x^3$, find the multiple regression equation for the cubic that best fits the given data.

x	−10	−5	−3	−1	3	5	8
y	−9.4	−19.9	−15.2	−11.5	0.5	8.4	23.3

The equation is $\hat{y} =$ ____ + ____ $x +$ ____ $x^2 +$ ____ x^3.

12.(1 pt) A study was conducted to detemine whether a the final grade of a student in an introductory psychology course is linearly related to his or her performance on the verbal ability test administered before college entrance. The verbal scores and final grades for 10 students are shown in the table below.

Student	Verbal Score x	Final Grade y
1	72	90
2	42	71
3	49	67
4	47	94
5	31	71
6	42	89
7	58	97
8	35	93
9	75	60
10	44	91

Find the following:
(a) The correlation coefficient
$r =$ ______
(b) The least squares line
$y =$ ______ + ______ x

13.(1 pt) For each paired data set, construct a scatterplot and identify the mathematical model that best fits the given data.

x	1	2	3	4	5	6	7
y	2	2.97	3.54	3.94	4.25	4.51	4.72

- A. Exponential
- B. Power
- C. Quadratic
- D. Logistic
- E. Logarithmic

x	1	2	3	4	5	6	7
y	0.3	0.99	2.06	2.72	2.93	2.98	3

- A. Power
- B. Logistic
- C. Linear
- D. Exponential
- E. Logarithmic