1 A 1

STATISTICS

SECTION II

Part A

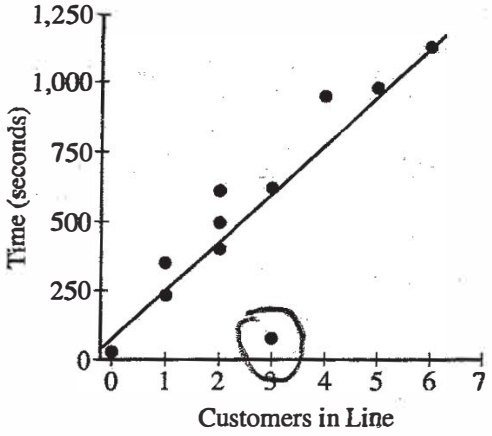
Questions 1-5

Spend about 1 hour and 5 minutes on this part of the exam.

Percent of Section II score—75

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

1. The manager of a grocery store selected a random sample of 11 customers to investigate the relationship between the number of customers in a checkout line and the time to finish checkout. As soon as the selected customer entered the end of a checkout line, data were collected on the number of customers in line who were in front of the selected customer and the time, in seconds, until the selected customer was finished with the checkout. The data are shown in the following scatterplot along with the corresponding least-squares regression line and computer output.



Predictor	Coef	SE Coef	T	P
Constant	72.95	110.36	0.66	0.525
Customers in line	174.40	35.06	4.97	0.001
S = 200.01		R-Sq = 73.33%	R-Sq (adj) = 70.37%	

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1A 2

(a) Identify and interpret in context the estimate of the intercept for the least-squares regression line.

The y intercept is 72.95 seconds. If there are no people in front of the customer, we would expect them to be finished with checkout in 72.95 seconds.

(b) Identify and interpret in context the coefficient of determination, r^2.

r^2 is 73.33%. 73.33% of the variation in checkout time is accounted for by the linear relationship between customers in line and checkout time.

(c) One of the data points was determined to be an outlier. Circle the point on the scatterplot and explain why the point is considered an outlier.

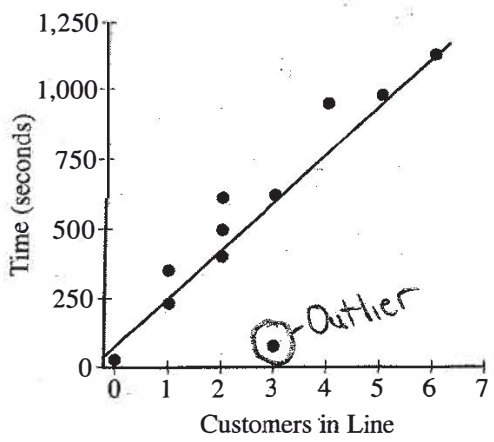
That point is an outlier because it does not follow the pattern the rest of the data point follow and is very far from the rest of the data.

1B 1

STATISTICS
SECTION II
Part A
Questions 1-5
Spend about 1 hour and 5 minutes on this part of the exam.
Percent of Section II score—75

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

1. The manager of a grocery store selected a random sample of 11 customers to investigate the relationship between the number of customers in a checkout line and the time to finish checkout. As soon as the selected customer entered the end of a checkout line, data were collected on the number of customers in line who were in front of the selected customer and the time, in seconds, until the selected customer was finished with the checkout. The data are shown in the following scatterplot along with the corresponding least-squares regression line and computer output.



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1B 2

(a) Identify and interpret in context the estimate of the intercept for the least-squares regression line.

The estimate of the intercept, which is 72.95 seconds, means that if there are no customers in the line, the predicted time to finish checkout is 72.95 seconds.

(b) Identify and interpret in context the coefficient of determination, r^2.

The r^2 value of 73.33% means that about 73.33% of the variation of time to finish checkout, y, can be explained by the least-squares regression line of customers in line, x, and time to finish checkout, y.

(c) One of the data points was determined to be an outlier. Circle the point on the scatterplot and explain why the point is considered an outlier.

This point is considered an outlier because its value is very far from the predicted value of the least-squares regression line. The point's value is about 180 while, when there are 3 customers in line, the LSRL predicts a value of about 600.

1C 1

STATISTICS

SECTION II

Part A

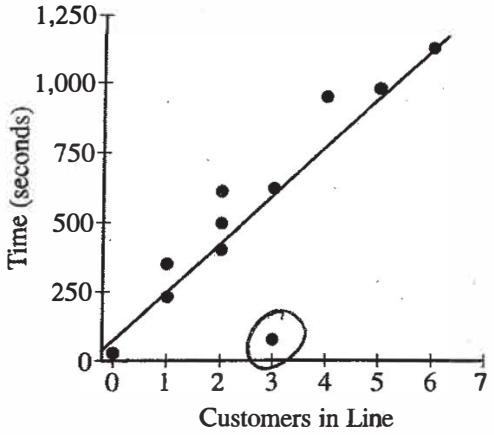
Questions 1-5

Spend about 1 hour and 5 minutes on this part of the exam.

Percent of Section II score—75

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

1. The manager of a grocery store selected a random sample of 11 customers to investigate the relationship between the number of customers in a checkout line and the time to finish checkout. As soon as the selected customer entered the end of a checkout line, data were collected on the number of customers in line who were in front of the selected customer and the time, in seconds, until the selected customer was finished with the checkout. The data are shown in the following scatterplot along with the corresponding least-squares regression line and computer output.



Predictor	Coef	SE Coef	T	P
Constant	72.95	110.36	0.66	0.525
Customers in line	174.40	35.06	4.97	0.001
S = 200.01		R-Sq = 73.33%	R-Sq (adj) = 70.37%	

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1C 2

(a) Identify and interpret in context the estimate of the intercept for the least-squares regression line.

The estimate given for the intercept is 72.95 seconds. This means that with 0 customers in line, one would expect the time to finish checkout to be approximately 72.95 seconds.

(b) Identify and interpret in context the coefficient of determination, r^2.

r^2 is given by the output as 70.37%, or 0.7037. This indicates that approximately 70.37% of the variance of results from the expected times (regression line) is accounted for by the least-squares regression line.

(c) One of the data points was determined to be an outlier. Circle the point on the scatterplot and explain why the point is considered an outlier.

The point at approximately (3, 100) is considered an outlier because it is significantly further from the regression line, or expected time for its number of customers, than any other point. This negatively affects the accuracy of the regression line.