1. The following data are average 1992-2001 (based on the first quarter) market shares of Japanese cars in the market. Do trend analysis to predict next year value.

27, 25.5, 26.4, 27.3, 28.2, 30.1, 32.4, 30.8, 34.1, 33.4

a. If a three-term moving average is used to smooth this series, what would be the second and the final calculated moving averages?
b. If this series is smoothed using exponential smoothing with a smoothing constant of 0.3, what would be the second term?
c. Suppose the last two exponential smoothed values are 34 and 32.76 (Note: they are not true number). What would you forecast as the value of the time series for next year?
d. We fit the linear, quadrate and exponential models for the data. Report MAPE, MAD and MSD for all models, select the best model. Explain.
e. Predict the sale for the **next year** for all models.

2. A major developer of housing communities in a city kept a record of the relative cost of labor and materials in its market areas for the past five years. These data are as follows:

Years	**1998**	**1999**	**2000**
Average Labor cost	SR 49000	57000	63000
Average Material Cost	SR 95000	104000	110000
% Material Cost	67	68	66

a. Determine the simple index for each component in the construction of the house using 1999 as the base year.
b. Find the unweighted aggregate index for the two components in the construction of the house using 1999 as the base year.
c. Construct a Paasche index number using 1999 as base year.
d. Construct a Laspeyres index number using 1999 as base year.

3. The data in the file (toys-rev) question 16.48 are quarterly revenues (in millions of dollars). For the years 1996 through 2005. Use the following MINITAB output to answer the following questions.

log $\hat{Y}$ **= 3.64 + 0.00199 X - 0.379 Q1 - 0.385 Q2 - 0.352 Q3**

where $\hat{Y}$ is the estimated number of contracts in a quarter
X is the coded quarterly value with $X = 1$ in the first quarter of 1996.
Q_1 is a dummy variable equal to 1 in the first quarter of a year and 0 otherwise.
Q_2 is a dummy variable equal to 1 in the second quarter of a year and 0 otherwise.
Q_3 is a dummy variable equal to 1 in the third quarter of a year and 0 otherwise.

a. The best interpretation of the coefficient of X (0.00199) in the regression equation is.
b. The best interpretation of the coefficient of Q_2 (-0.385) in the regression equation is.
c. To obtain a forecast for the fourth quarter of 2006 using the model, what should we use for Q1, Q2 and Q3?
d. Using the regression equation, forecast the revenue for the third quarter of 2006.

Figure 1

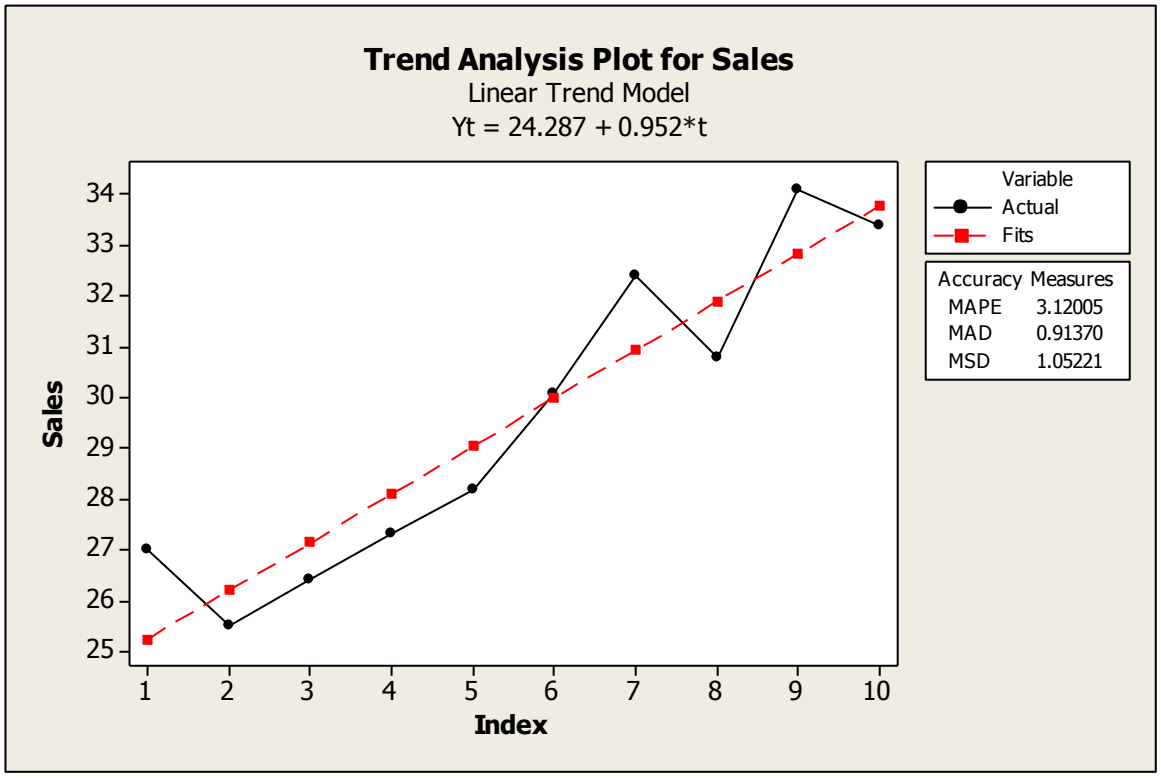


Figure 2

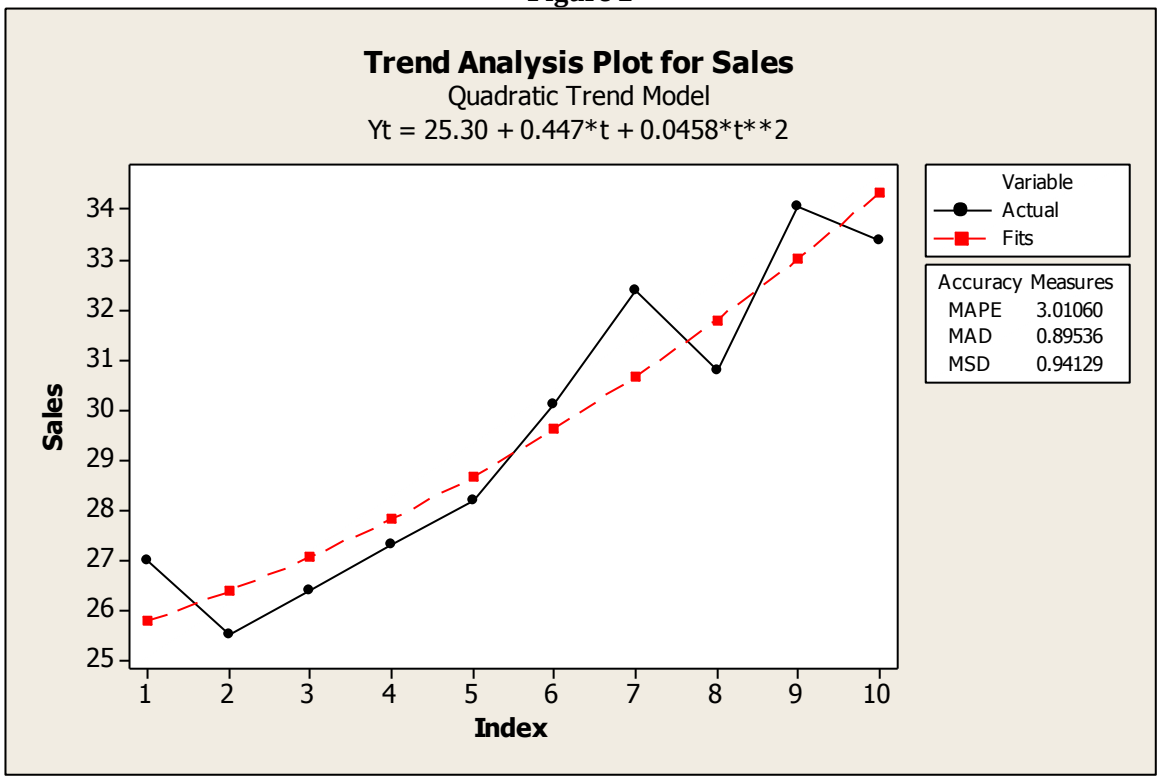
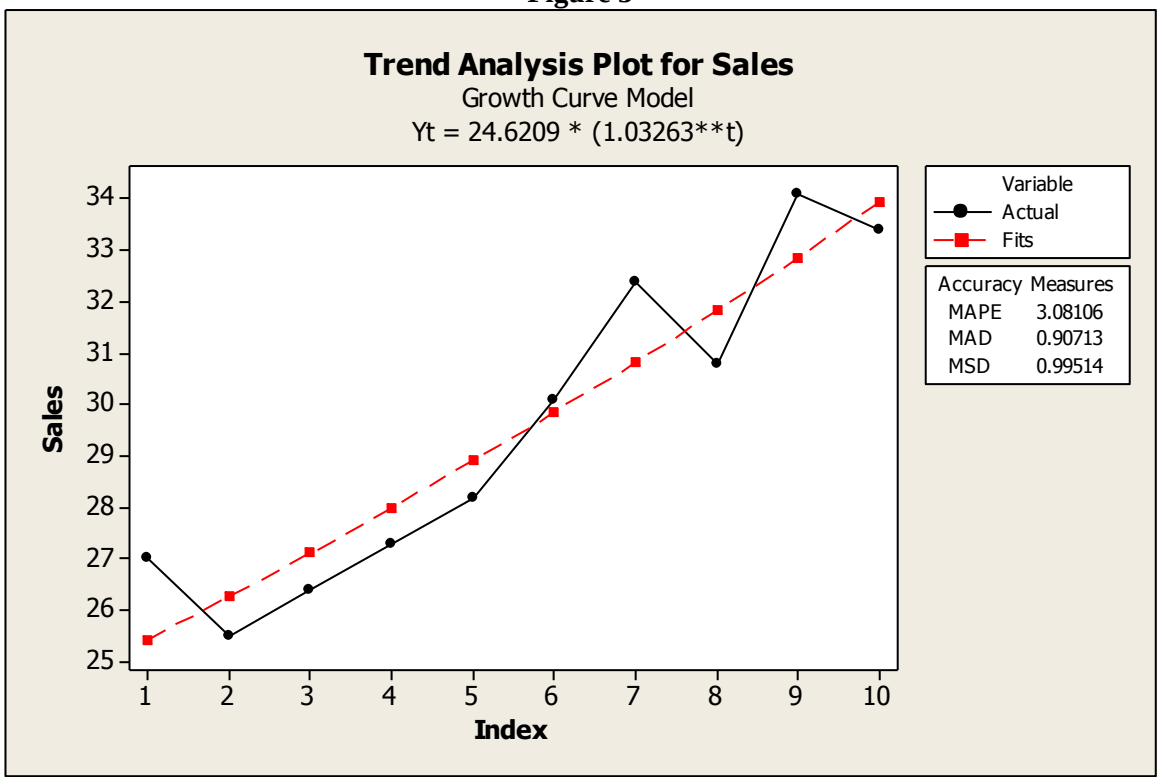


Figure 3


Trend Analysis Plot for Sales
Growth Curve Model
Yt = 24.6209 * (1.03263**t)
Sales
Index
34
33
32
31
30
29
28
27
26
25
1
2
3
4
5
6
7
8
9
10
Variable
Actual
Fits
Accuracy Measures
MAPE 3.08106
MAD 0.90713
MSD 0.99514