

CHAPTER 2 Relations

2.3 Use Scatter Plots to Analyse Data

Scatter plots, dependent and independent variables, and outliers

Example:

a) Fern did a science experiment to test Beer's Law, which states that as a solution becomes more concentrated, light absorption in the solution increases. His data are shown. Identify the dependent variable and the independent variable.

b) Make scatter plots of these data using a graphing calculator, a spreadsheet, and statistics software.

c) How does the value of the dependent variable appear to change as the independent variable changes?

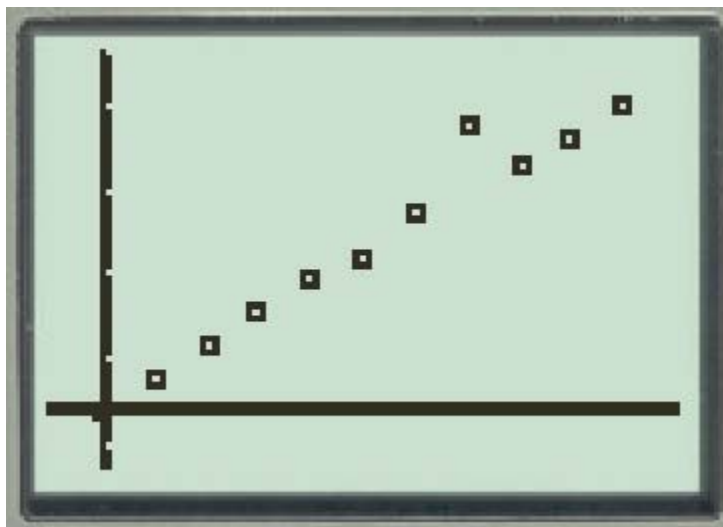
d) Identify any outliers in these data.

Concentration ($\mu\text{M/L}$)	Absorption (%)
0	0
20	4.7
40	9.6
60	13.5
80	18.2
100	21.4
120	27.3
140	39.7
160	34.2
180	37.9
200	42.6

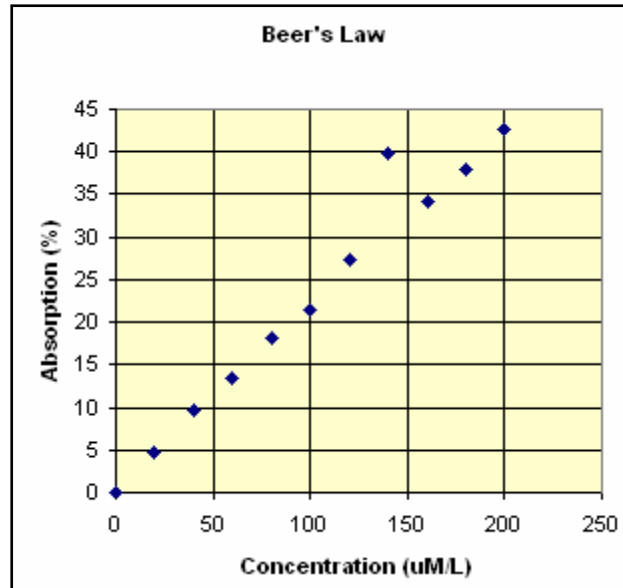
Solution:

a) The concentration is the independent variable. The absorption is the dependent variable.

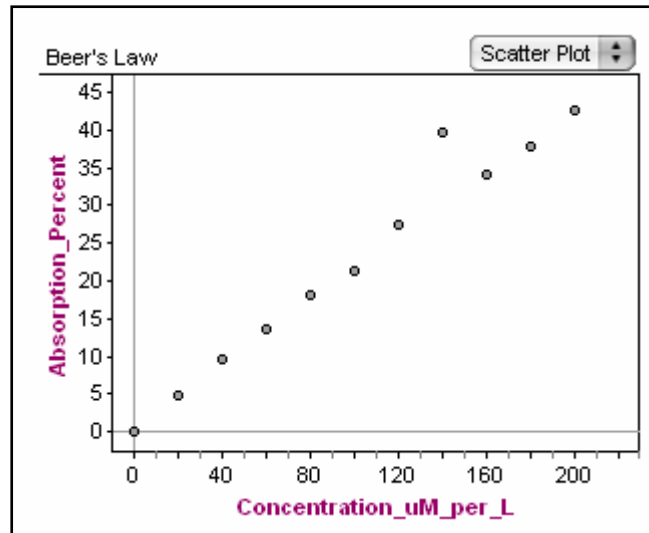
b) Graphing Calculator:



Spreadsheet



Statistical Software:



c) The dependent variable appears to increase as the independent variable increases.

d) The data (140, 29.7) appear to be an outlier.

Practice:

1. The Scholastic Aptitude Test (SAT) score and first year algebra scores for 7 students are shown.

SAT Score	Algebra Score (%)
1100	89
1150	91
1200	93
1250	85
1300	95
1350	97
1400	98

a) Identify the dependent variable and the independent variable.

b) Make scatter plots of these data using a graphing calculator, a spreadsheet, and statistics software.

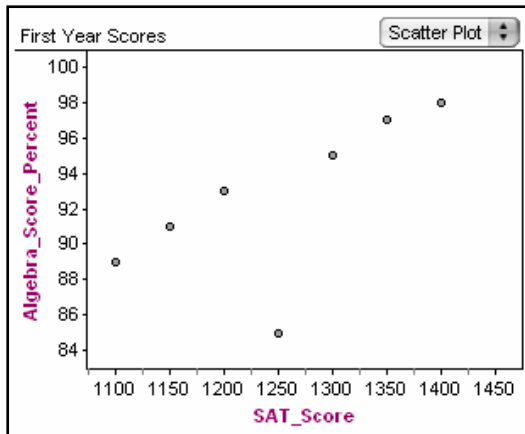
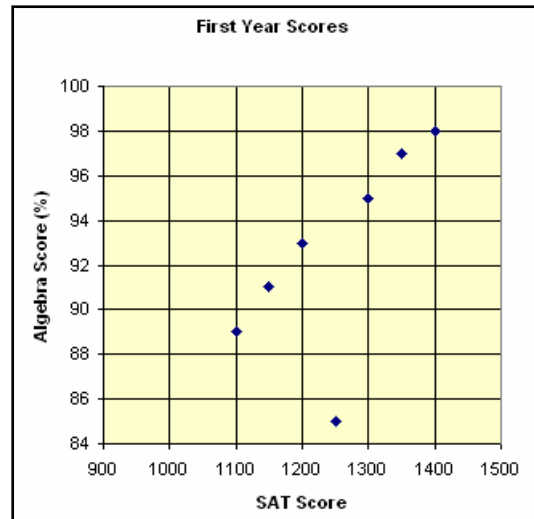
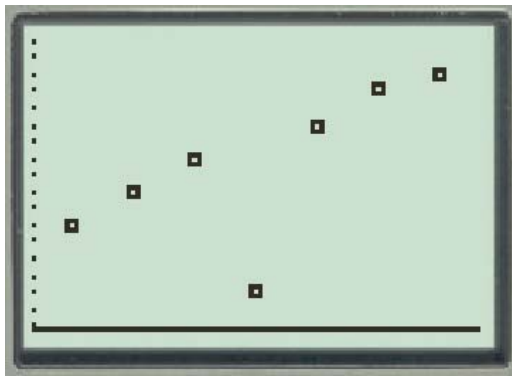
c) How does the value of the dependent variable appear to change as the independent variable changes?

d) Identify any outliers in these data.

Answers:

1. a) Independent: SAT Score Dependent: Algebra Score

b)



c) The value of the dependent variable appears to increase as the independent variable increases.

d) The data (1250, 85) appear to be an outlier.