

# SOLUTIONS MANUAL



## Chapter 2

2.1 a Nominal

b Interval

c Nominal

d Interval

e Ordinal

2.2 a Interval

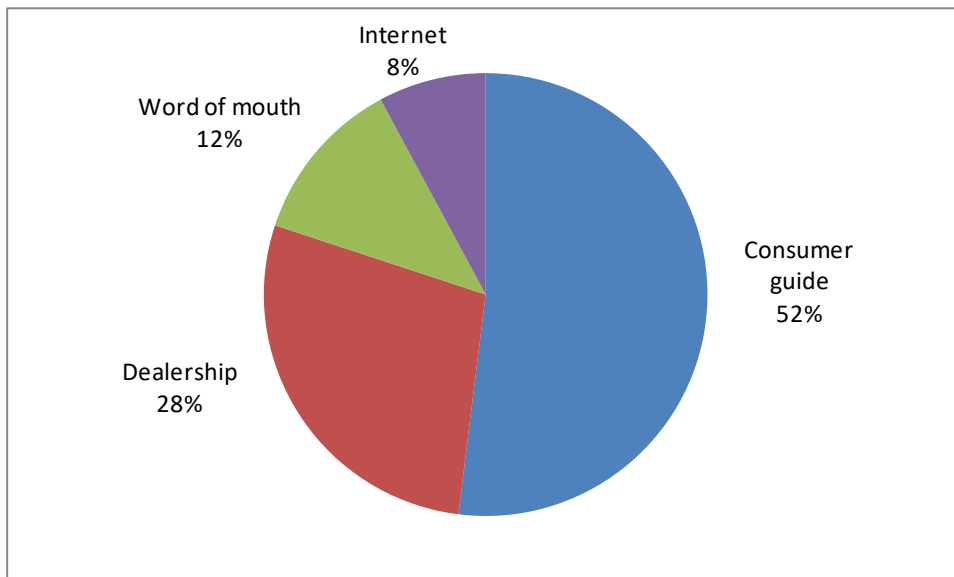
b Interval

c Nominal

d Ordinal

e Interval

2.3



2.4 a Software Frequency

Excel 34

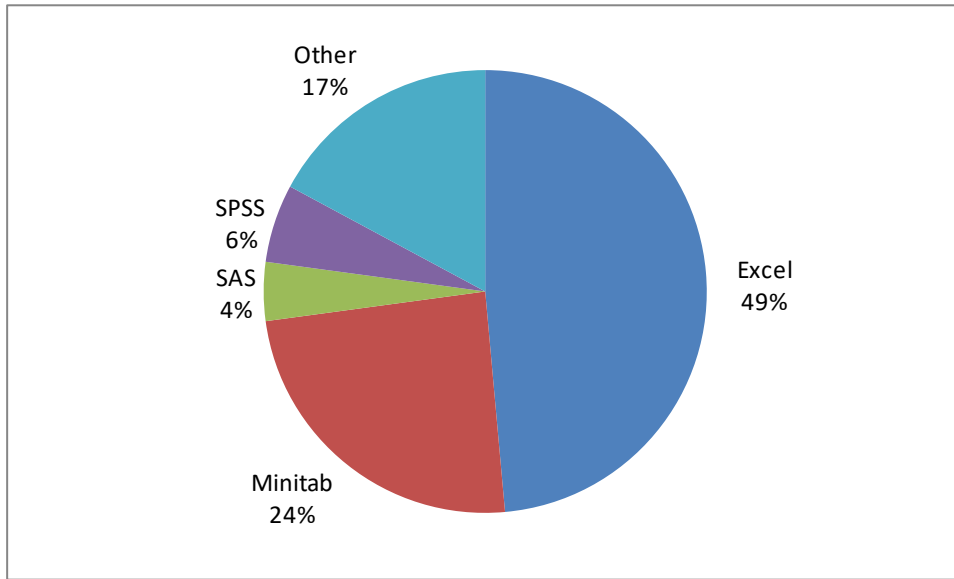
Minitab 17

SAS 3

SPSS 4

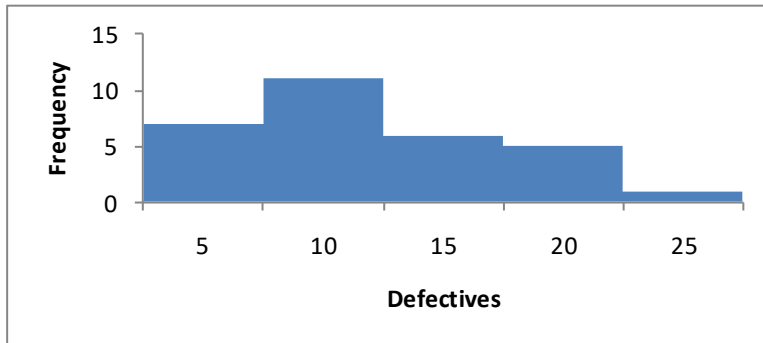
Other 12

b



c Excel is the choice of about half the sample, one-quarter have opted for Minitab, and a small fraction chose SAS and SPSS.

2.5a

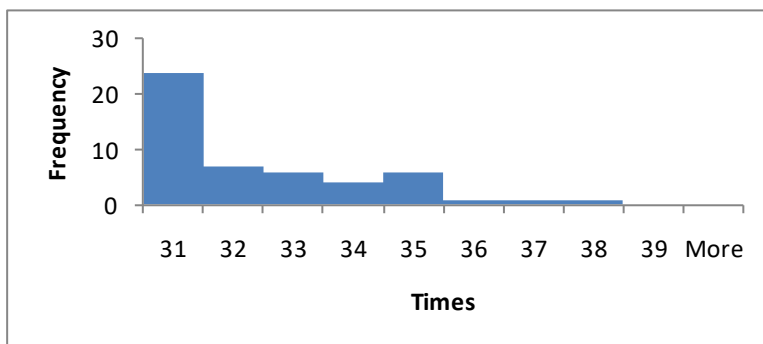


b The histogram is unimodal and somewhat positively skewed.

2.6 a

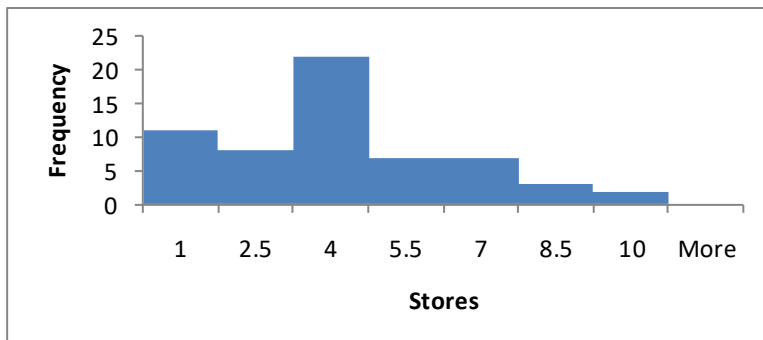
Stem & Leaf Display			
Stems	Leaves		
30	->0112222222356667777788		
31	->001113568		
32	->024777		
33	->0047		
34	->024455		
35	->7		
36	->7		
37	->9		

b



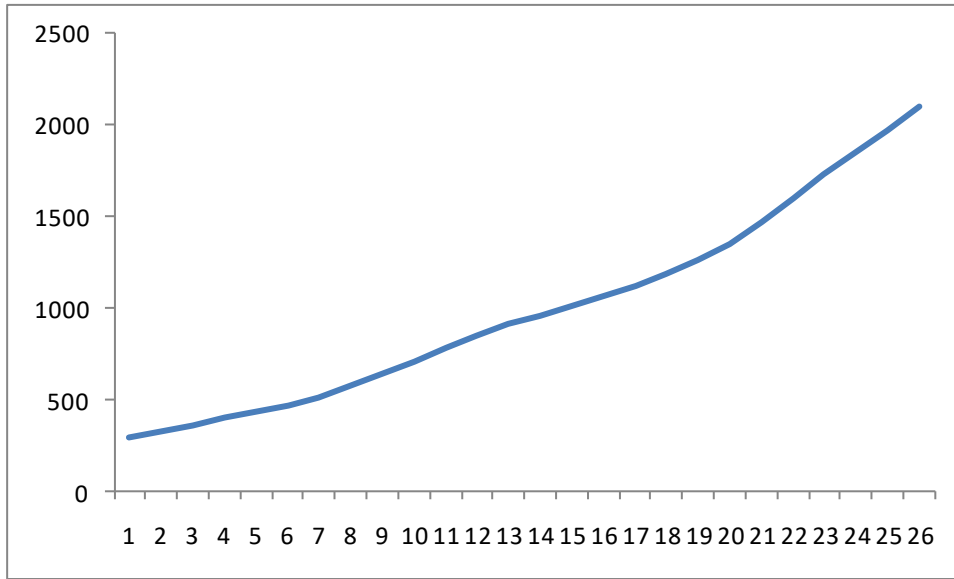
c The histogram is positively skewed.

2.7

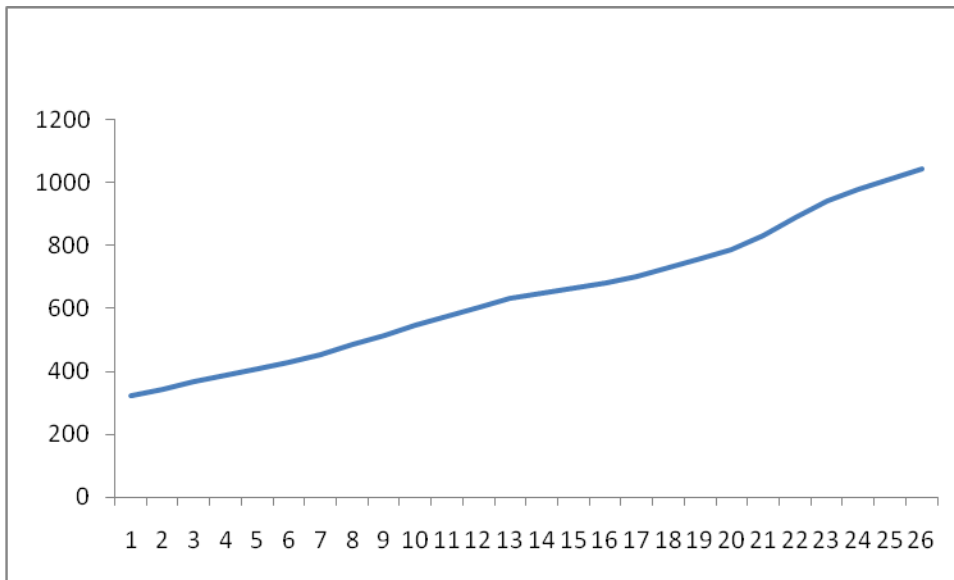


The number of stores is bimodal and positively skewed.

2.8a

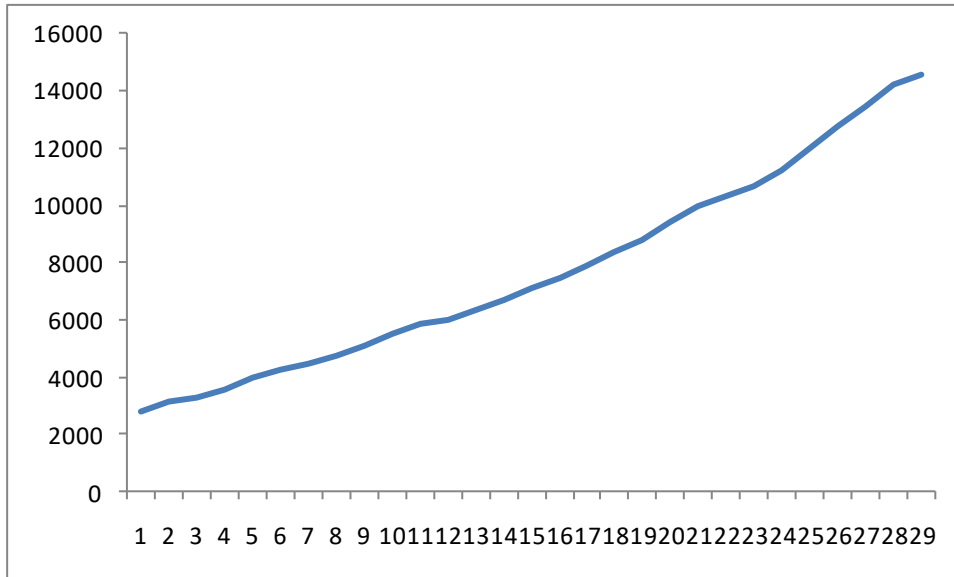


b.



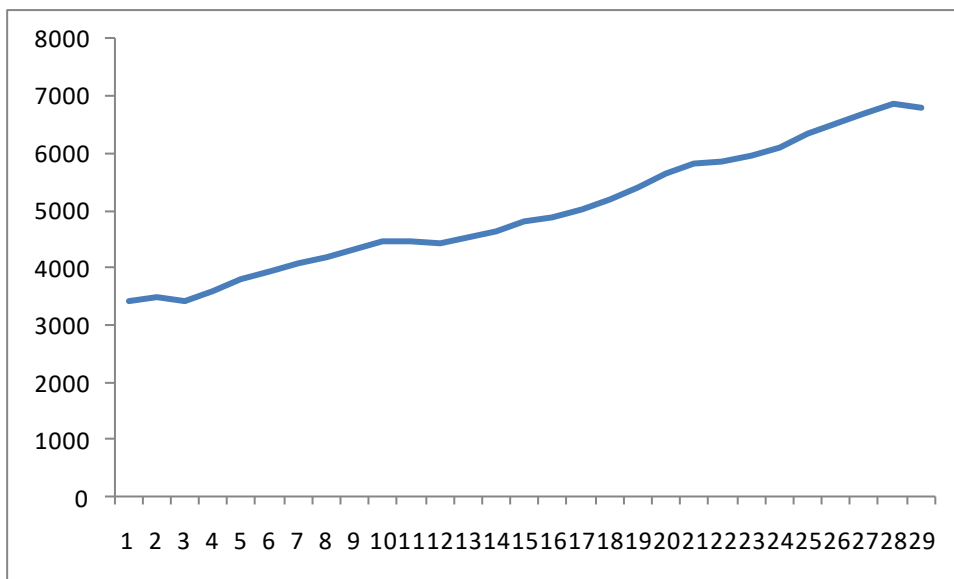
Total health care expenditures are rising faster than inflation

2.9a



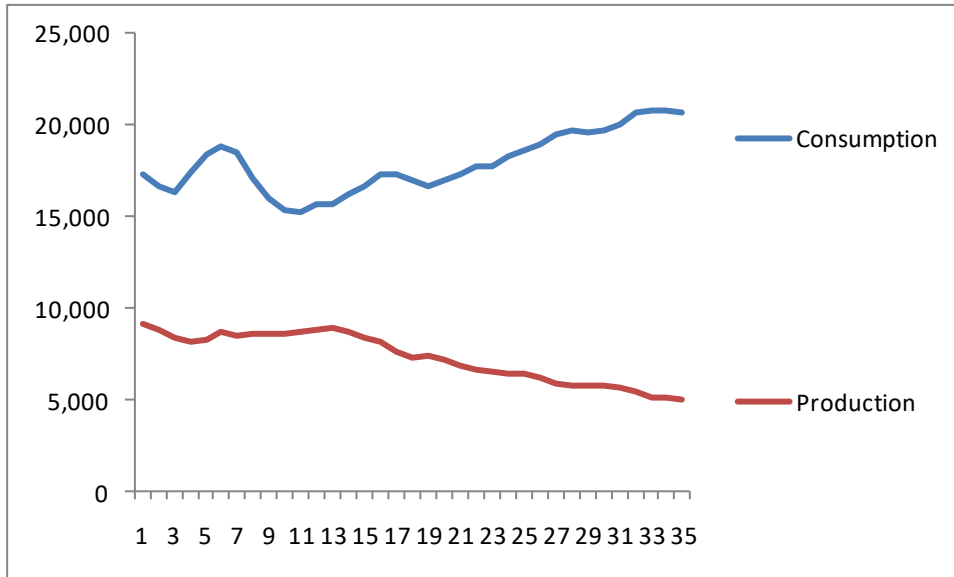
GDP increased rapidly over the 29 year period.

b



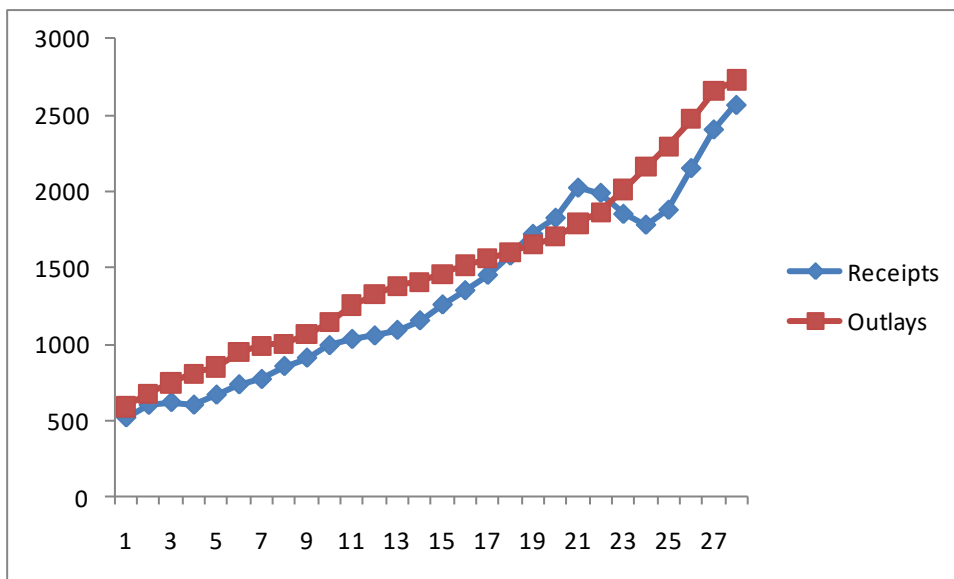
The inflation-adjusted GDP grew at a moderate rate.

2.10

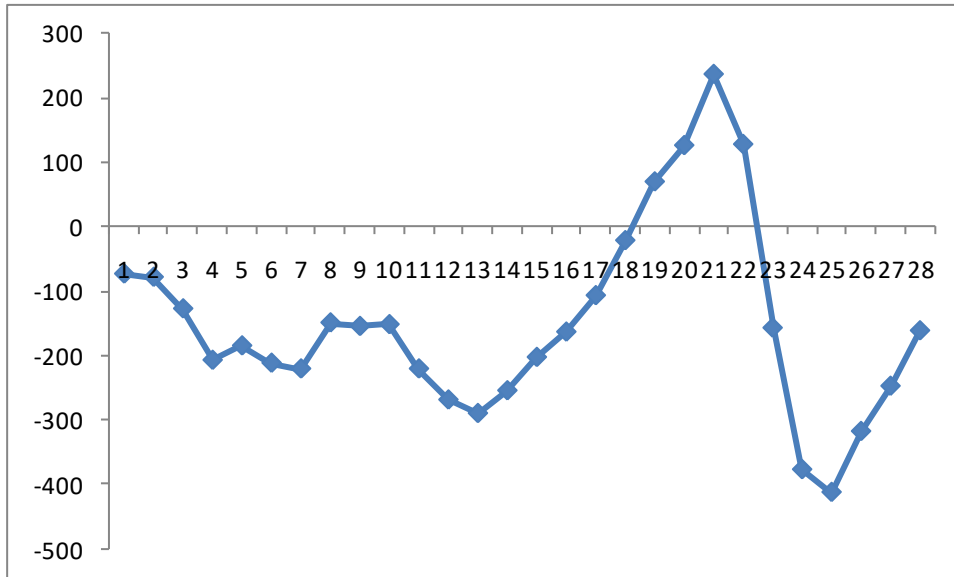


Consumption is increasing and production is falling.

2.11

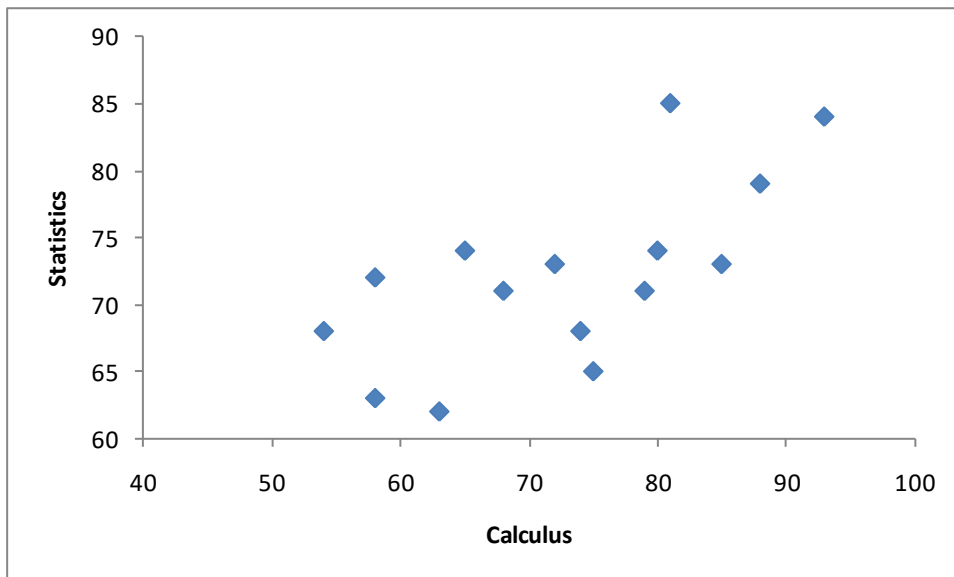


b



Over the last 28 years both receipts and outlays increased rapidly. There was a five-year period where receipts were higher than outlays. Between 2004 and 2007 the deficit has decreased.

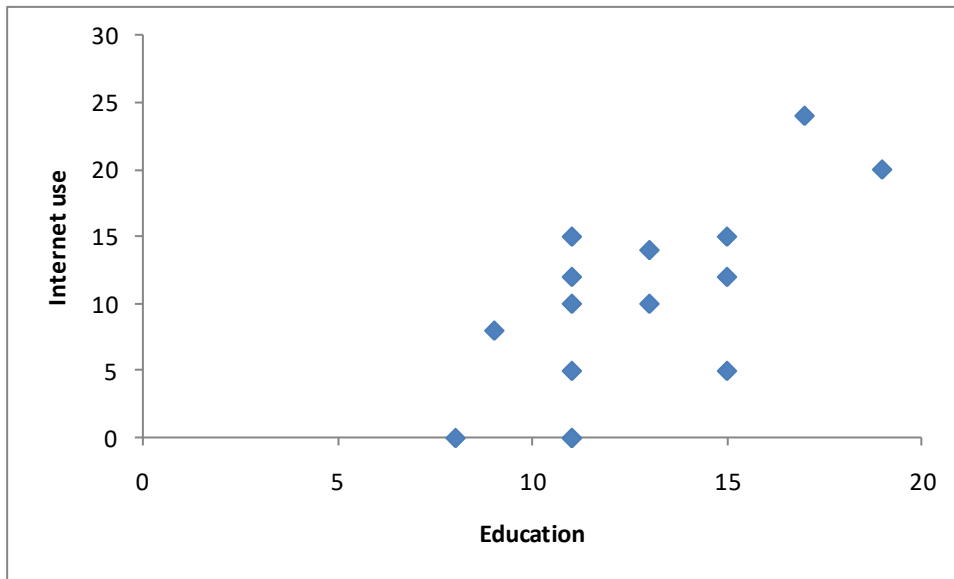
2.12a



b. There is a positive linear relationship between calculus and statistics marks.

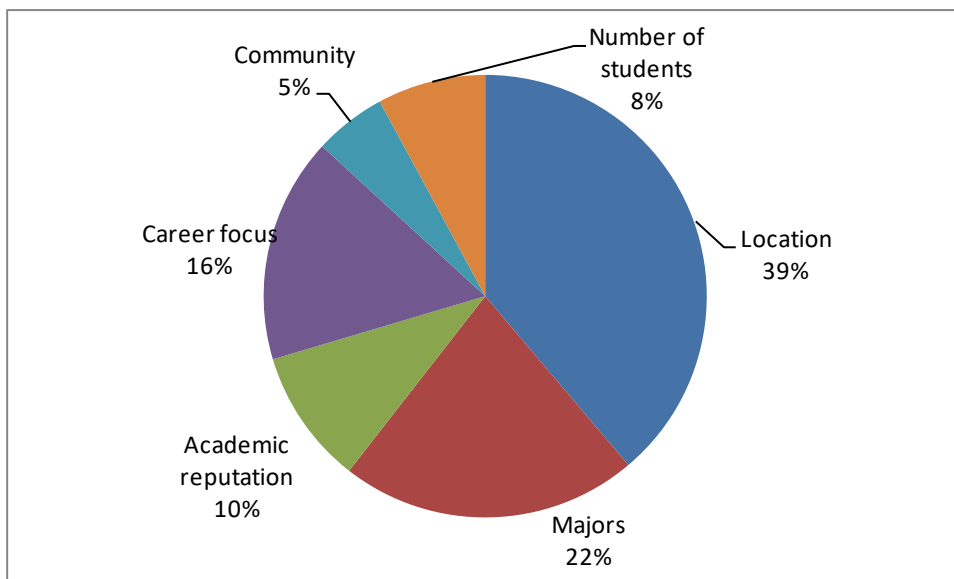


2.13a



b. There is a moderately strong positive linear relationship. In general those with more education use the Internet more frequently.

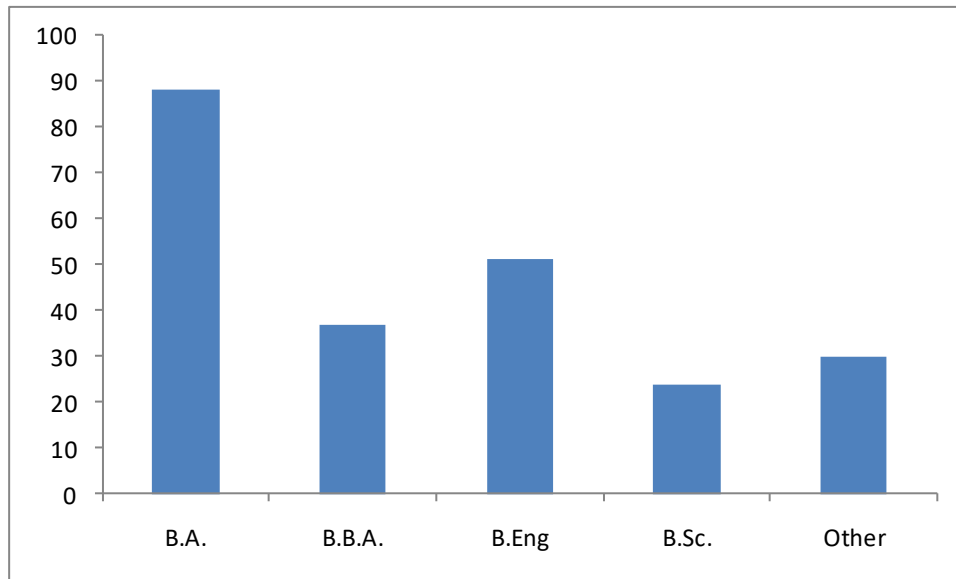
2.14



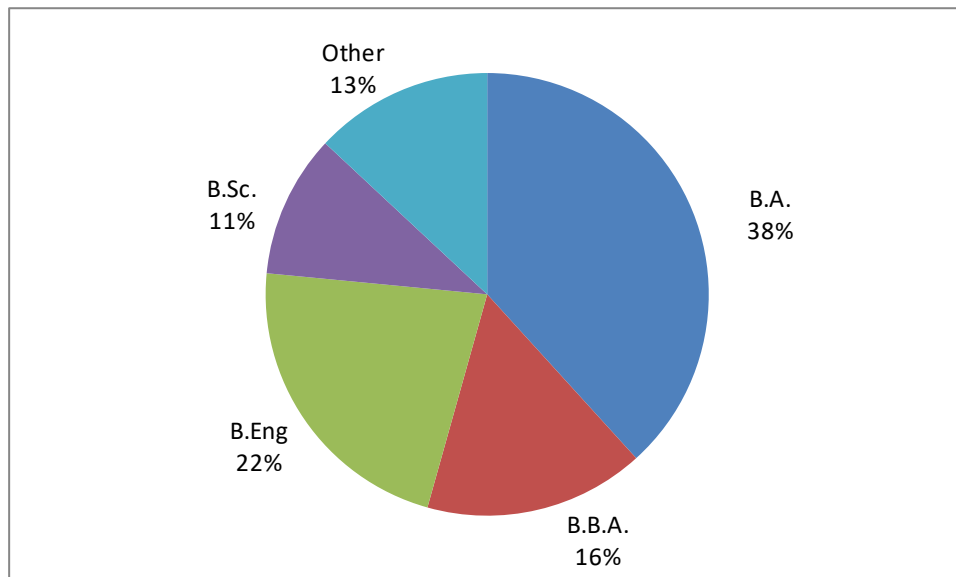
2.15a Degree      Frequency

BA	88
BBA	37
B Eng	51
B Sc	24
Other	30

b.

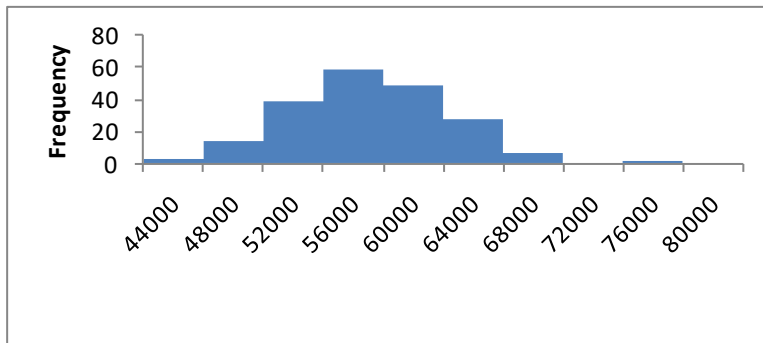


c.



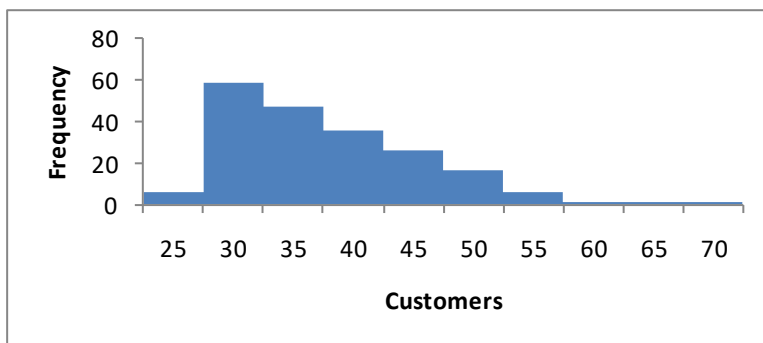
d. About 4 applicants in 10 have the BA degree, about one-fifth have a BEng. and one-sixth have a BBA.

2.16



The histogram is symmetric, unimodal, and bell shaped.

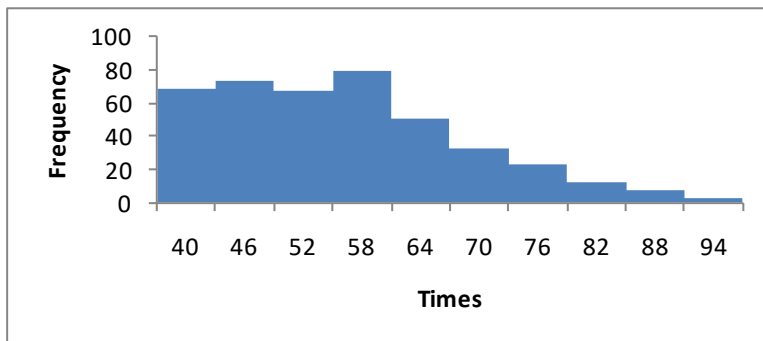
2.17



The histogram is unimodal and positively skewed.

2.18 a The histogram should contain 9 or 10 bins. We chose 10.

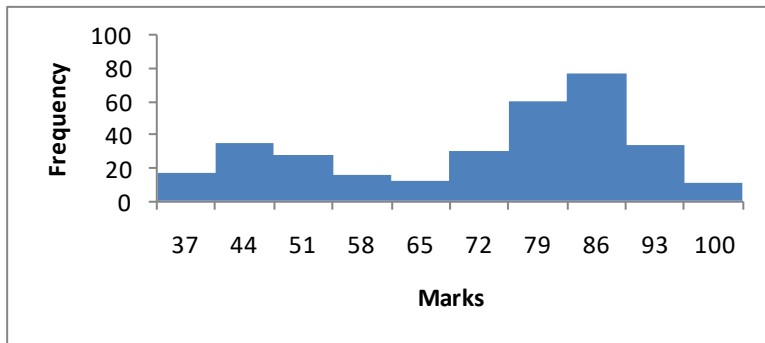
b



c The histogram is positively skewed.

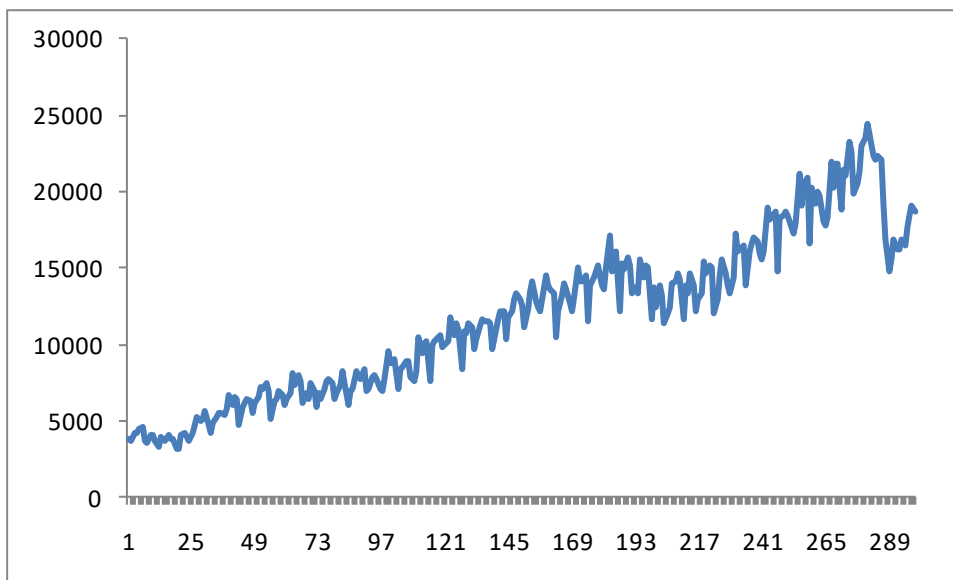
d The histogram is not bell-shaped.

2.19

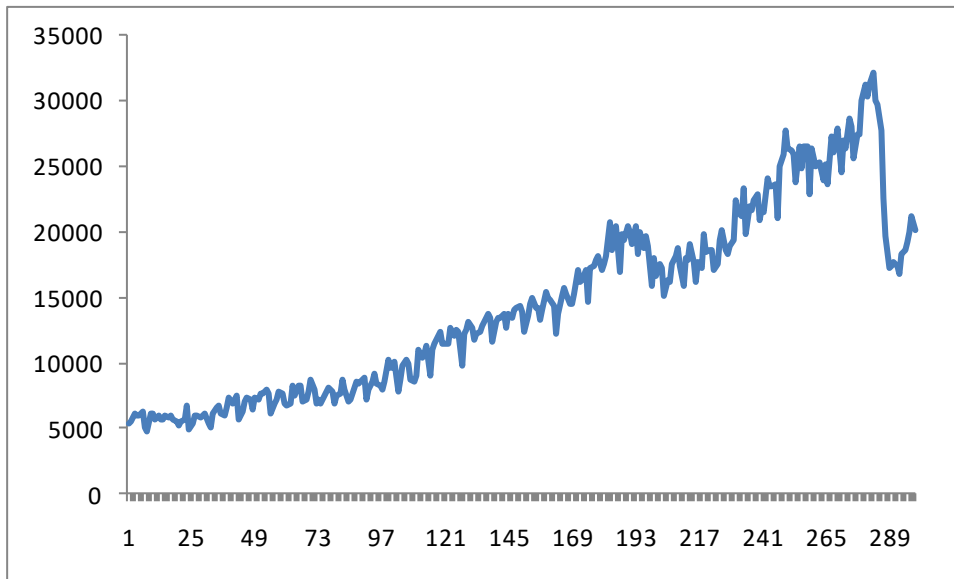


The histogram is negatively skewed, bimodal, and not bell shaped.

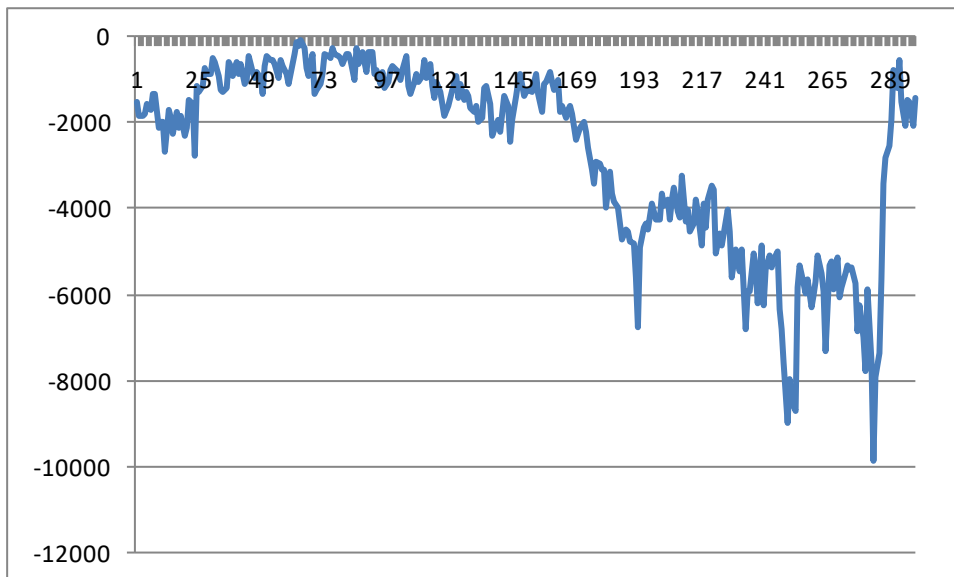
2.20a. Exports to Canada



b. Imports from Canada

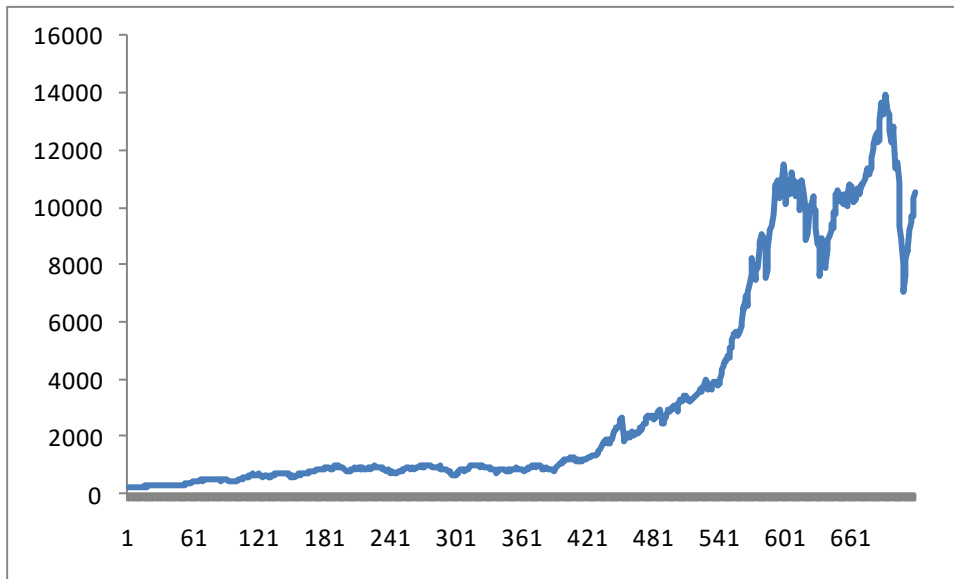


c. Balance of trade: Exports to Canada – Imports from Canada



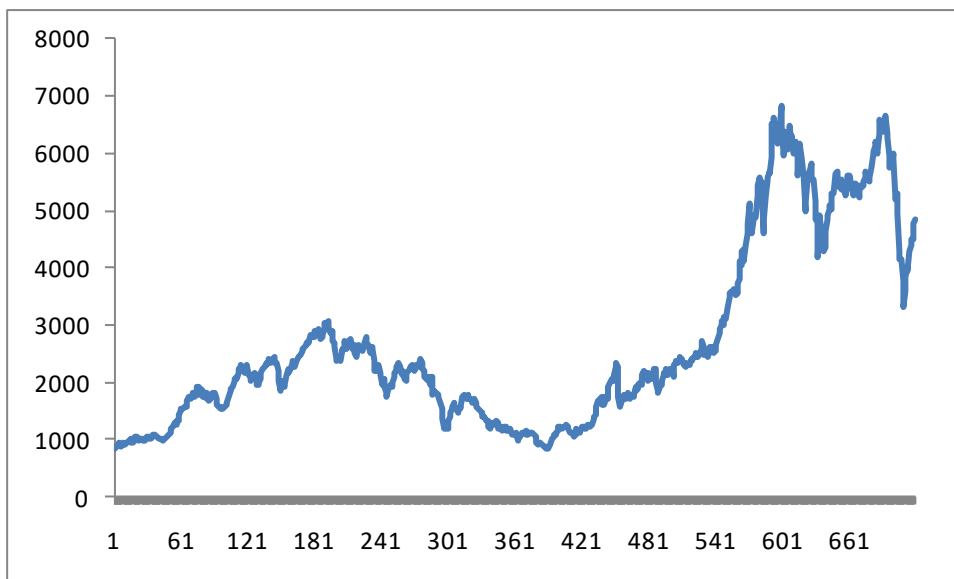
d. Imports from Canada have greatly exceeded exports to Canada.

2.21



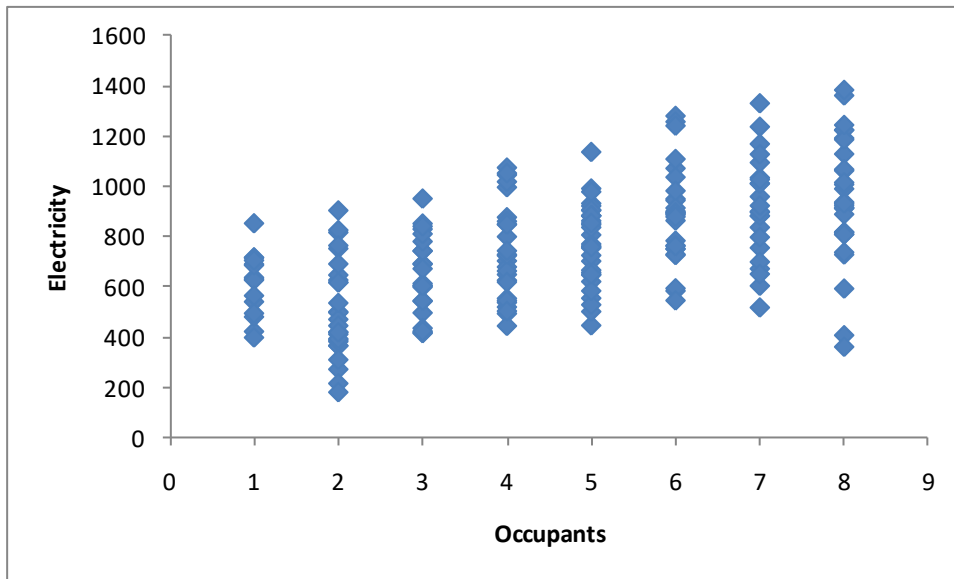
The index grew slowly until month 400 and then grew quickly until month 600. It then fell sharply and recently recovered.

2.22

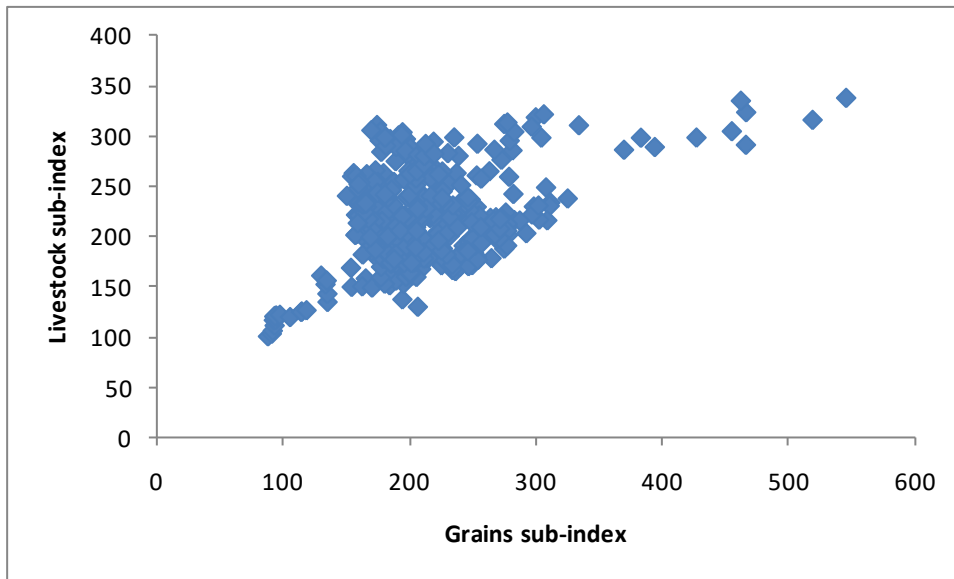


The inflation-adjusted index displays far less volatility.

2.23a

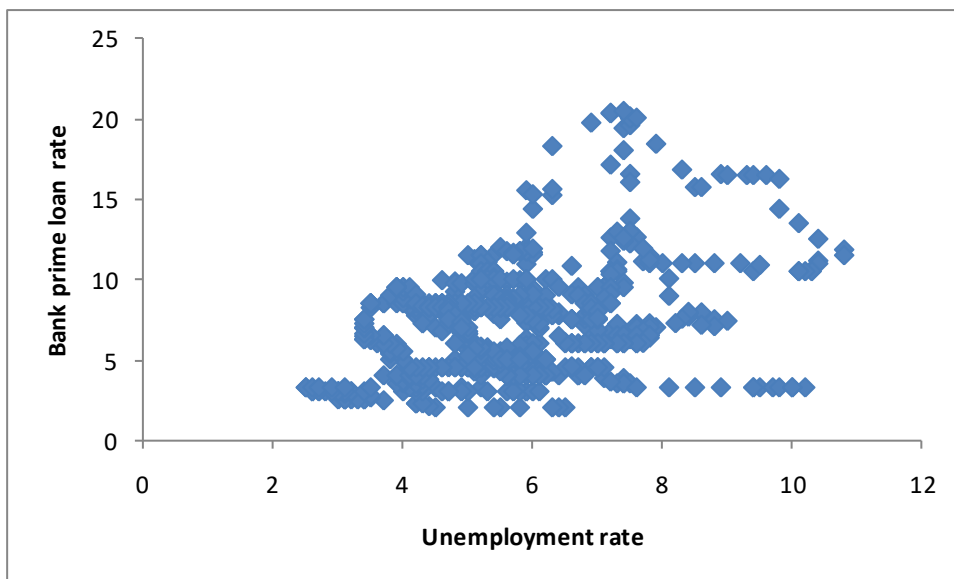


2.25



There is moderately strong positive linear relationship.

2.26



There is a weak positive linear relationship.