

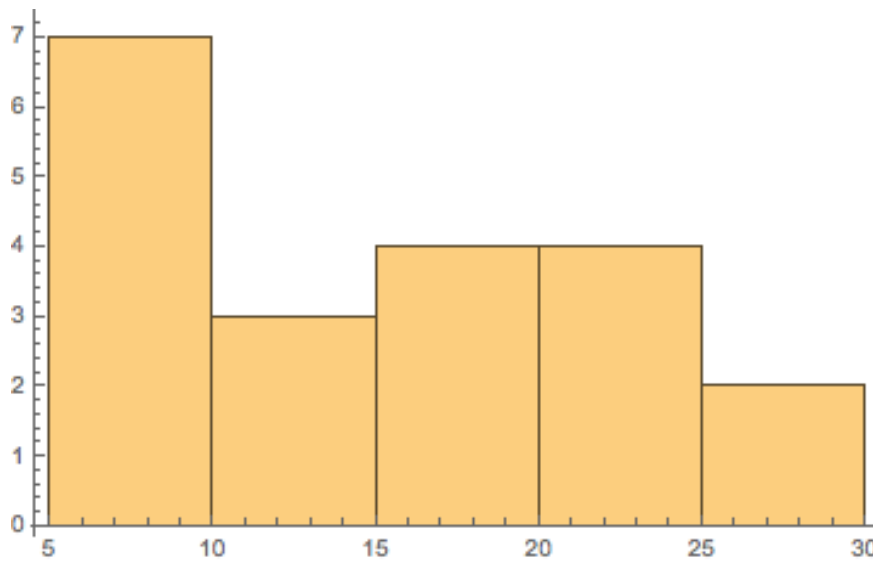
Problem 1: Construct a frequency distribution, relative frequency distribution, and cumulative frequency distribution table for the following data using 5 classes: Also, sketch a histogram for the

5 10 7 19 25
12 15 26 13 8
17 17 22 21 7
7 24 23 6 5

frequency distribution of the data. Describe the distribution.

Solution. We have 20 values, the largest is 26 and the smallest is 5. We want 5 classes so we need a class width of $\frac{26-5}{5} = 4.2 \approx 5$ (since we round up). This yields a frequency distribution of...

Class	Frequency	Relative Frequency (%)	Cumulative Frequency (%)
5-9	7	35.0	35.0
10-14	3	15.0	50.0
15-19	4	20.0	70.0
20-24	4	20.0	90.0
25-29	2	10.0	100.0



Clearly, the distribution is right skewed.

Problem 2: Construct a leaf-and-stem plot of the following data:

1.1, 2.5, 3.6, 3.2, 7.1, 2.5, 2.1, 4.7, 5.0, 5.1

Stem	Leaves
1	1
2	155
3	26
4	7
5	01
6	
7	1

Stem units: 1

Problem 3: The following table is a count of voters in a local election, broken down by sex and party affiliation.

	Federalist Party	Whig Party	Free Soil Party
Male	134	265	47
Female	323	121	34

(a) How many total men voted?

$$134 + 265 + 47 = 446$$

(b) How many total Whig Party members voted?

$$265 + 121 = 386$$

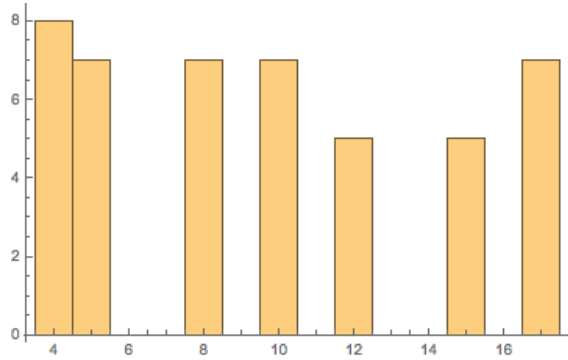
(c) How many men or Free Soil Party members voted?

$$134 + 265 + 47 + 34 = 480$$

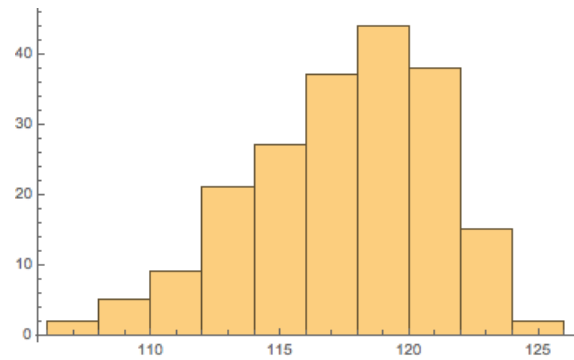
(d) What percent of Federalist Party voters in this election were female?

$$\frac{\text{Female Federalists}}{\text{Federalists}} = \frac{323}{134 + 323} = \frac{323}{457} = 0.707 = 70.7\%$$

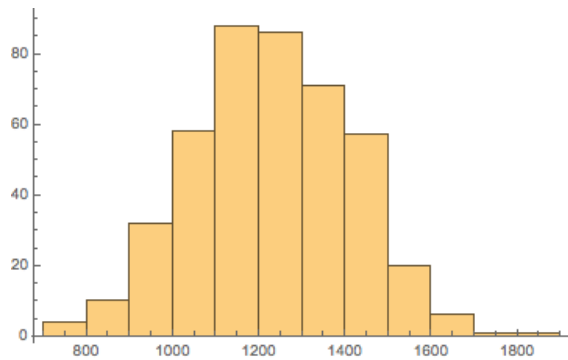
Problem 4: Determine if the following distributions are symmetric or skewed. If it is skewed, indicate whether the distribution is right skewed or left skewed.



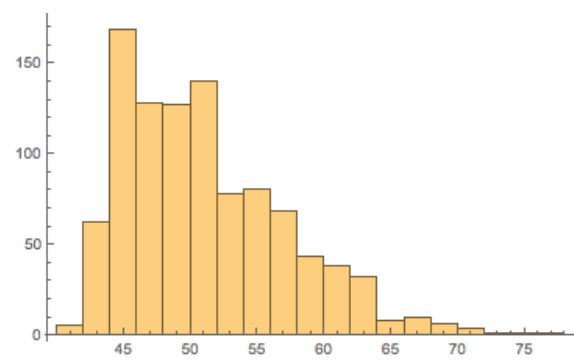
(a)



(b)



(c)



(d)

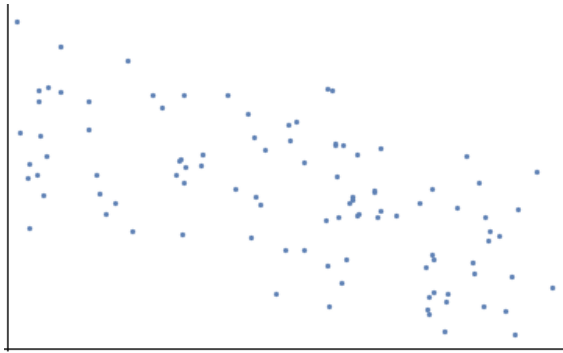
(a) _____ *Symmetric*

(b) _____ *Left Skewed*

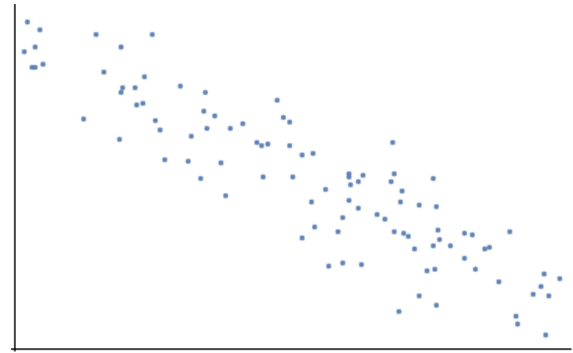
(c) _____ *Symmetric*

(d) _____ *Right Skewed*

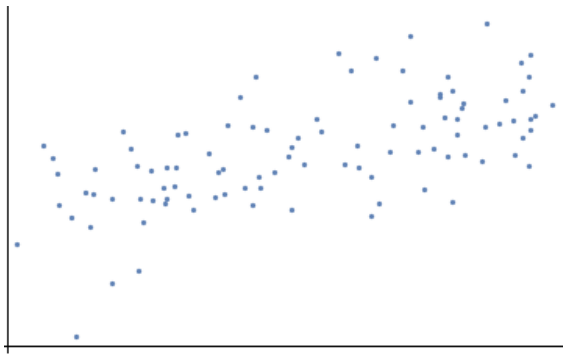
Problem 5: Match each of the following scatterplots with its regression equation and correlation coefficients. Note that the scale on each axes is the same.



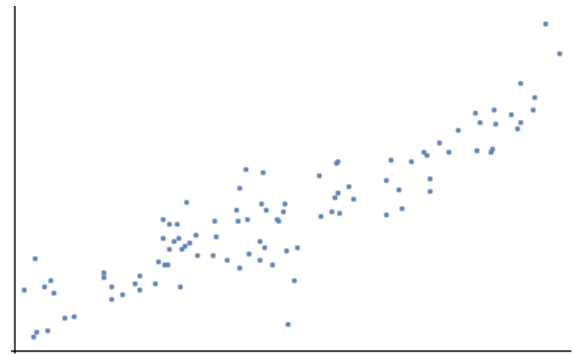
(a)



(b)



(c)



(d)

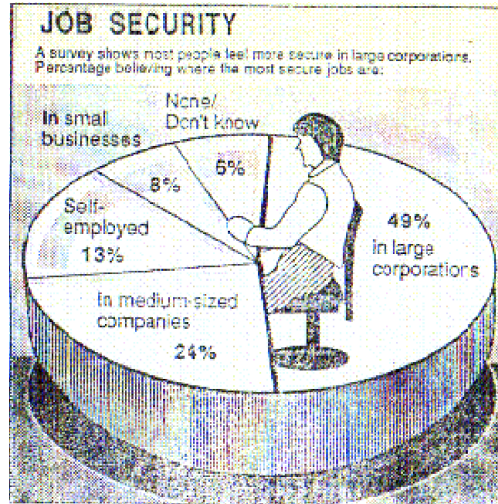
_____ d _____ : $r = 0.899, \hat{y} = 3.16\hat{x} + 4473$

_____ a _____ : $r = -0.617, \hat{y} = -11.63\hat{x} + 4285$

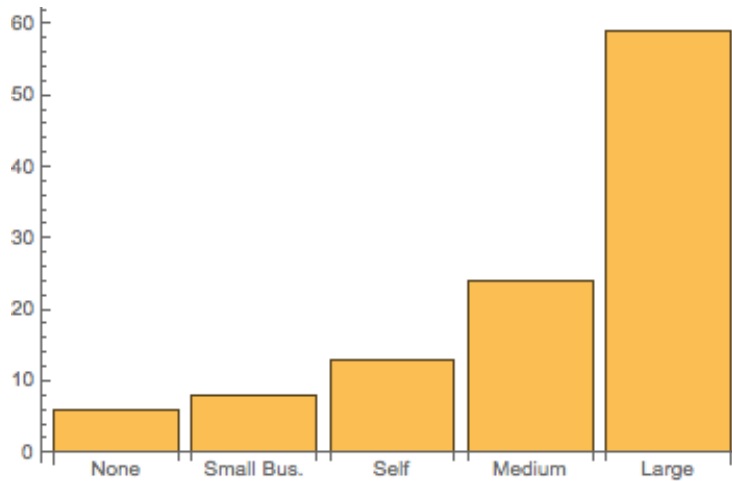
_____ b _____ : $r = -0.899, \hat{y} = -3.16\hat{x} + 4473$

_____ c _____ : $r = 0.617, \hat{y} = 11.63\hat{x} + 4285$

Problem 6: Identify problems in the presentation of data in the following chart. Identify how you might correct the figure.



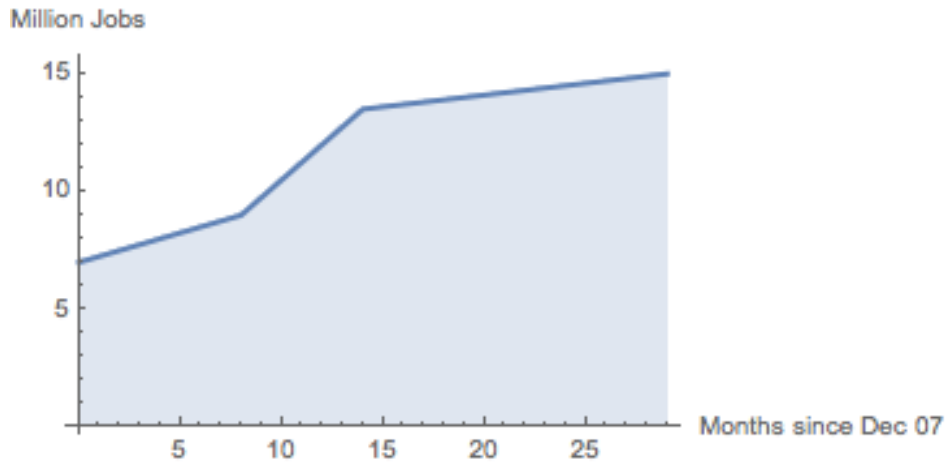
Solution. The 'None/Don't know' category looks bigger than the 'In small businesses' category despite the fact that the latter is larger! The 'In large corporations' category does not look quite as close to the full half the pie as perhaps it should. Some labels are inside the pie and others outside. They seem to show a male in the pie chart rather than a more gender neutral representation. Almost always, what can be given by a pie chart can be more clearly given by a bar graph.



Problem 7: Identify problems in the presentation of data in the following chart. Identify how you might correct the figure.



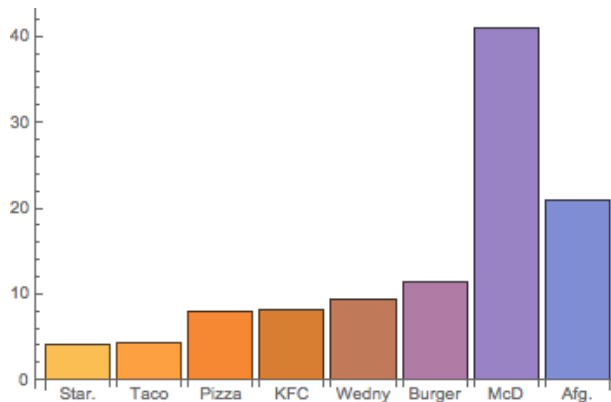
Solution. The horizontal axis is not evenly spaced: December to September is 8 months, September to March is 6 months, March to June is 15 months! The vertical axis is not seen or labeled. In the vertical direction, each dot is about one line apart but these cannot be evenly spaced: seven to nine million is 2 million, nine million to thirteen and a half million is 4.5 million, and thirteen and a half million to fifteen million is 1.5 million. Therefore, the vertical axes uses an uneven scale. The plot has been forced to show linear growth. One should show the axes and have them use a consistent scale.



Problem 8: Identify problems in the presentation of data in the following chart. Identify how you might correct the figure.



Solution. The GDP of Afghanistan is obscured in the figure. Moreover, the GDP of Afghanistan is twice that of KFC but the Afghanistan image has more than twice the area of the KFC image. Similarly, the KFC image has about four times the area of the Starbucks logo while it only has about twice the income. Moreover, the labels with arrows just make the figure 'busy.' All this information could be more clearly conveyed in a bar graph.



W. Hickey. "The 27 Worst Charts of all Time." 06/26/2013. <http://www.businessinsider.com/the-27-worst-charts-of-all-time-2013-6>.
 C.J. Schwarz. "A short tour of bad graphs." <http://people.stat.sfu.ca/~cschwarz/Stat-650/Notes/PDF/ChapterBadgraphs.pdf>