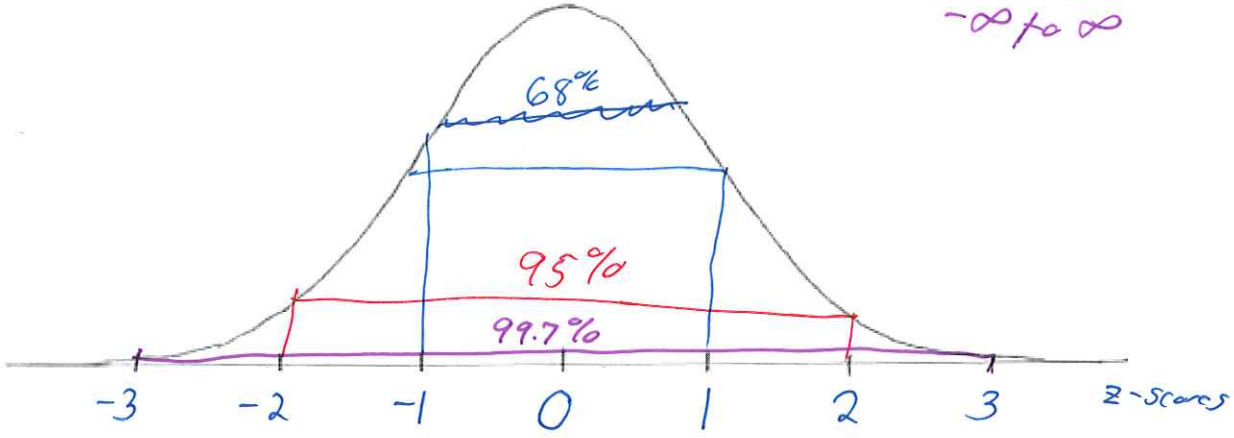
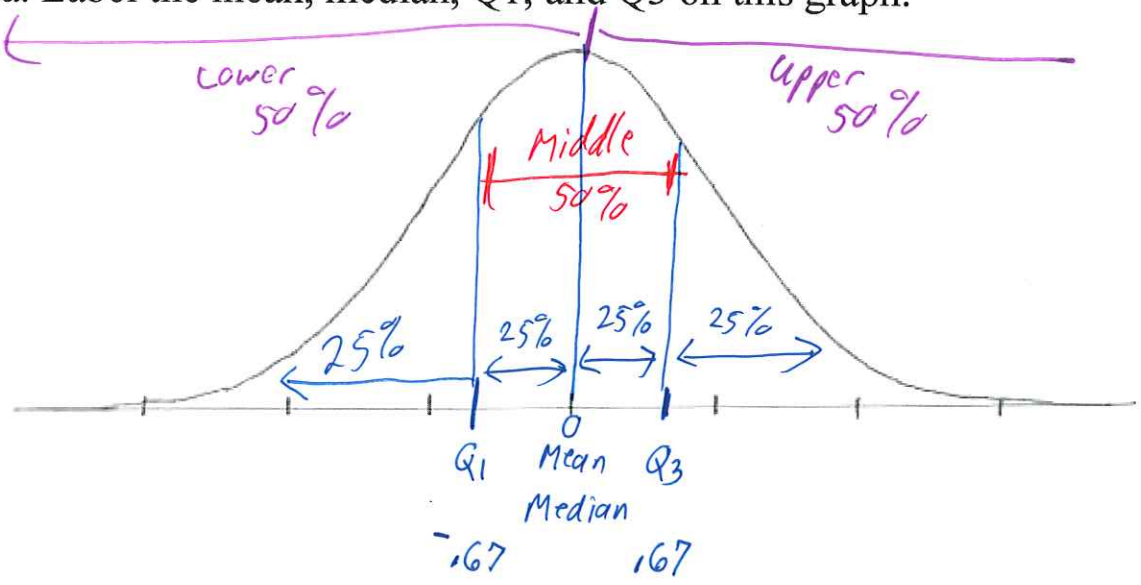
Exam 2 Additional ReviewProblems

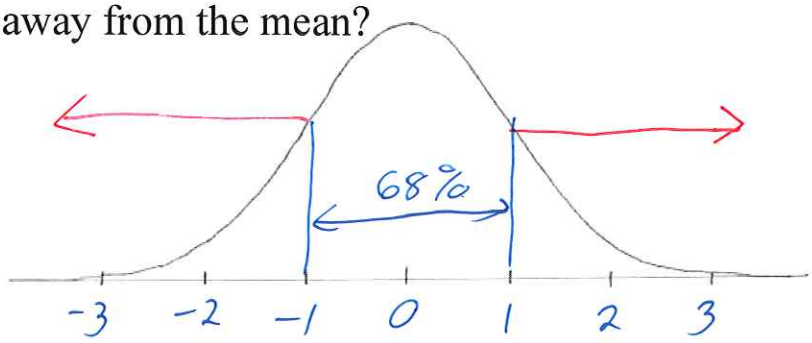
1. On this graph, label the middle 68%, middle 95%, and middle 99.7% of the data. Describe where 100% of the data lies. Below curve from $-\infty$ to ∞



2. On this graph, label the upper 50%, lower 50% and middle 50% of the data. Label the mean, median, Q1, and Q3 on this graph.

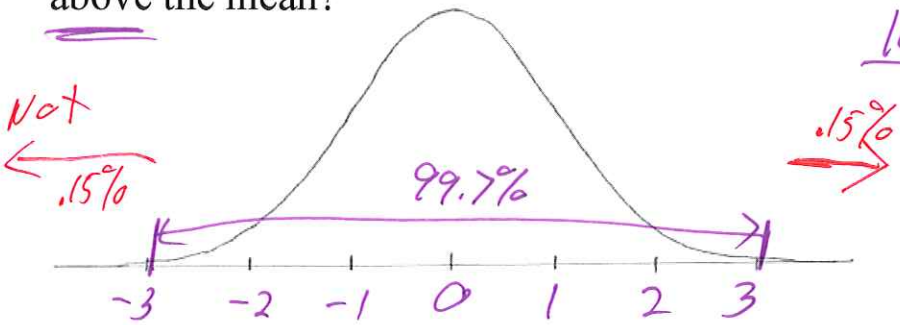


3. What percentage of your data is further than 1 standard deviation away from the mean?



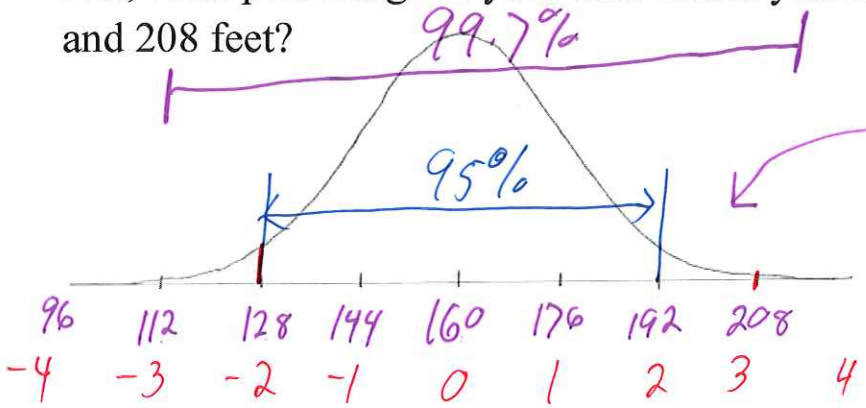
$100 - 68\% = 32\%$

4. What percentage of your data is further than 3 standard deviations above the mean?



$\frac{100\% - 99.7\%}{2} = \frac{.3\%}{2} = .15\%$

5. If the mean of your data is 160 feet, and the standard deviation is 16 feet, what percentage of your data would you expect between 128 feet and 208 feet?



$\frac{99.7\% - 95\%}{2} = \frac{4.7\%}{2} = 2.35\%$

$95\% + 2.35\% =$

97.35%

6. If the mean of your data is 160 feet, and the standard deviation is 16 feet, what is the z-score of 100 feet?

$$\text{Z-Score} = \frac{X - \text{mean}}{\text{Std dev}} = \frac{100 - 160}{16} = \frac{-60}{16} = -3.75$$

Q1 Median Q3

30 42 42 48 50 58 58 60 61 68 70 73 75 182

7. Using the following data:

42 48 50 60 70 58 61 73 42 30 68 58 75 182

a. Compute the mean, median, and mode.

$\text{Mean} = \frac{30+42+42+48+50+58+58+60+61+68+70+73+75+182}{14} = \frac{917}{14} = 65.5$

$\text{Median} = \frac{58+60}{2} = 59$

Mode = 42 and 58

b. Compute the 5-number summary

Min = 30

$Q_1 = 48$

Q_2 = Median = 59

$Q_3 = 70$

Max = 182

c. Draw the boxplot.

d. What are the outliers (if any) in this data?

$IQR = Q_3 - Q_1 = 70 - 48 = 22$

$1.5\,IQR = 1.5(22) = 33$

Low outliers if below $Q_1 - 1.5\,IQR = 48 - 33 = 15$ ← No low outliers

High outliers if above $Q_3 + 1.5\,IQR = 70 + 33 = 103$

182 is high outlier

We have one high outlier

e. How does the outlier affect the mean and median?

Outlier pulls mean toward itself

Outlier does not affect median (much)