

1. Find the mean, the median, and the mode, if any, for the given data. Round non-integer means to the nearest tenth.

order

$$12, 17, 14, 12, 8, 19, 21 \Rightarrow 8, 12, 12, 14, 17, 19, 21$$

Mean = $\frac{8+12+12+14+17+19+21}{7} = \frac{103}{7} \approx 14.7$

Median = 14 (middle # when list is in order)

Mode = 12 (most often - there are two of these)

2. Use the 4.0 grading system:

A = 4, A- = 3.67, B+ = 3.33, B = 3, B- = 2.67, C+ = 2.33, C = 2, C- = 1.67,
D+ = 1.33, D = 1, D- = 0.67, F = 0.00

A student's grade point average (GPA) is calculated as a weighted mean, where the student's grade in each course is given a weight equal to the number of semester credits for the course. Find Justin's GPA for the fall semester. Round to the nearest **hundredth**.

Course	Course Grade	Semester Credits
Mathematics	A	3
English	C+	3
Computers	B-	2
Biology	B	4
Art	A	1

$$\frac{3 \times 4 + 3 \times 2.33 + 2 \times 2.67 + 4 \times 3 + 1 \times 4}{3 + 3 + 2 + 4 + 1}$$

$$= \frac{12 + 6.99 + 5.34 + 12 + 4}{13}$$

$$= \frac{40.33}{13} \approx 3.10 \text{ GPA}$$

3. Find the range, the standard deviation, and the variance for the given **samples**. Round non-integer results to the nearest hundredth.

12, 18, 20, 14, 16

L1 on calculator
1-Var Stats L1

Range = $20 - 12 = 8$

Standard Deviation = 3.16 (use S_x because it is a SAMPLE)

Variance = $3.16^2 \approx 10.00$ 9.99

$3.16227766^2 \approx 10.00$

$$z = \frac{x - \bar{x}}{s}$$

4. A population data set has a mean of $\bar{x} = 81$ and a standard deviation of 5.2. Find the z-scores for each of the following. Round to the nearest hundredth.

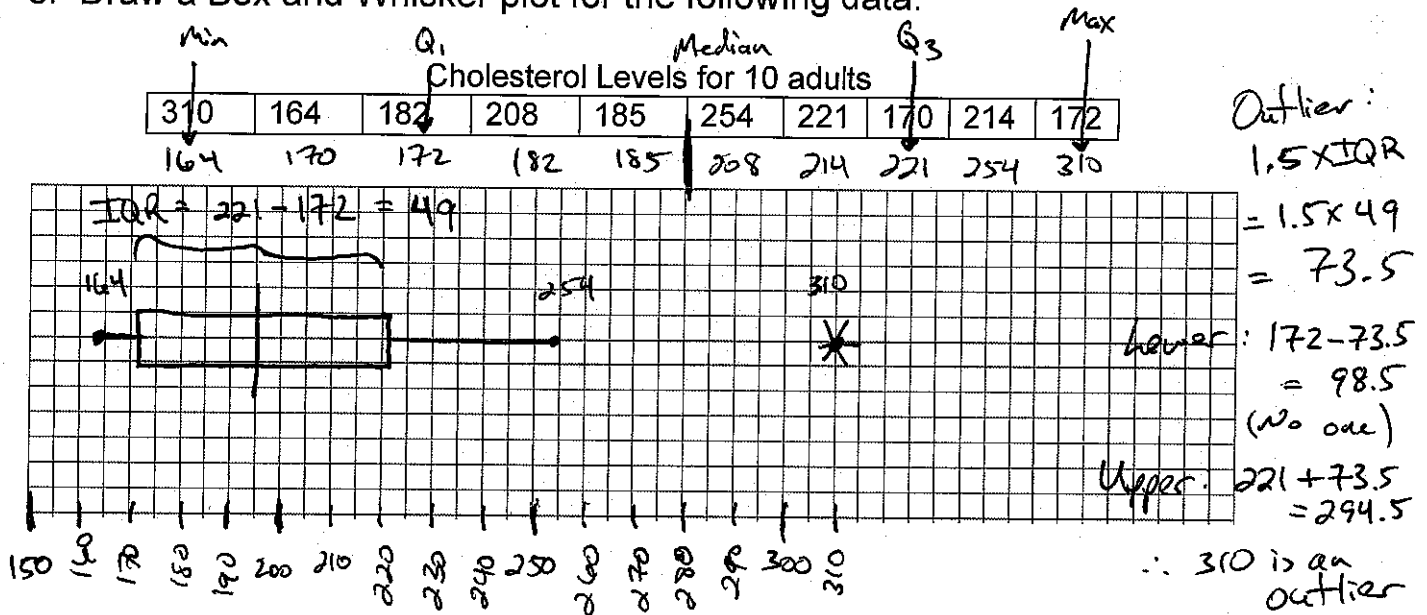
a) $x = 72$

$$z = \frac{72 - 81}{5.2} = \frac{-9}{5.2} \approx -1.73$$

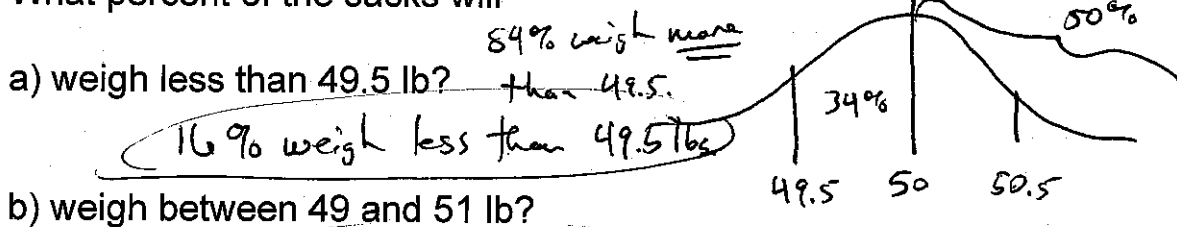
b) $x = 84$

$$z = \frac{84 - 81}{5.2} = \frac{3}{5.2} \approx 0.58$$

5. Draw a Box and Whisker plot for the following data:

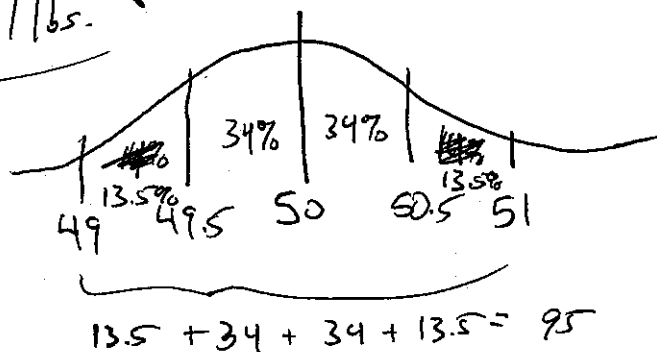


6. The weights of all the sacks of dog food filled by a machine are normally distributed, with a mean weight of 50 lb and a standard deviation of 0.5 lb. What percent of the sacks will



b) weigh between 49 and 51 lb?

95% weigh between 49 and 51 lbs.



7. Use the following relative frequency distribution to determine the

a) percent of states that paid an average teacher salary of at least \$48,000

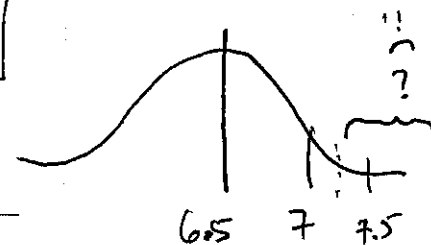
$$100 - (4 + 18) = 100 - 22 = 78\% \quad \text{OR} \quad (28 + 8 + 18 + 4 + 8 + 4 + 6 + 2) = 78\%$$

b) percent that a state selected at random paid an average teacher salary of at least \$56,000 but less than \$72,000

$$8 + 18 + 4 + 8 + 4 + 6 = 48\%$$

**Average Salaries of Public School Teachers,
2014–2015**

Average salary, s	Number of states	Relative frequency
$\$40,000 \leq s < \$44,000$	2	4%
$\$44,000 \leq s < \$48,000$	9	18%
$\$48,000 \leq s < \$52,000$	14	28%
$\$52,000 \leq s < \$56,000$	4	8%
$\$56,000 \leq s < \$60,000$	9	18%
$\$60,000 \leq s < \$64,000$	2	4%
$\$64,000 \leq s < \$68,000$	4	8%
$\$68,000 \leq s < \$72,000$	2	4%
$\$72,000 \leq s < \$76,000$	3	6%
$\$76,000 \leq s < \$80,000$	1	2%



SOURCE: National Education Association

8. A phone manufacturer finds the life span of its telephones are normally distributed, with a mean of 6.5 years and a standard deviation of 0.5 years.

Calculator

a) What percent of its telephones will last at least 7.25 years?

$$\text{Normal cdf}(7.25, 1000, 6.5, 0.5) = .066807 \Rightarrow 6.7\%$$

b) What percent of its telephones will last between 5.8 and 6.8 years?

$$\text{Normal cdf}(5.8, 6.8, 6.5, 0.5) = .6449902 \Rightarrow 64.5\%$$

9. A student has recorded the data in the following table, which shows the distance a spring stretches in inches for a given weight in pounds.

Weight, x	80	100	110	150	170
Distance, y	6.2	7.4	8.3	11.1	12.7

← L_1 in calculator

← L_2 in calculator

Stat → Calc → Lin Reg L_1, L_2

a) Find the linear correlation coefficient for the data. (nearest ten-thousandth)

$$r = .9992$$

b) Find the equation for the line of best fit (nearest hundredth)

$$\hat{y} = 0.07x + 0.29$$

c) Use the equation to predict the distance a weight of 195 lb will stretch the spring.

$$= 0.07(195) + 0.29$$

$$= 13.94 \text{ inches}$$

10. A test of an Internet service provider showed the following download times (in seconds) for files of various sizes (in megabytes).

Download Times			
Size	Time	Size	Time
10.5	0.20	110	2.01
12.9	0.24	156	2.68
15	0.27	163	2.87
20	0.36	175	3.10
60	1.09	200	3.64
75	1.42	250	4.61

Stat → Calc → Lin Reg L_1, L_2

a) Find the linear correlation coefficient for the data. (nearest ten-thousandth)

$$r = 0.9991$$

b) Find the equation for the line of best fit. (nearest ten-thousandth)

$$\hat{y} = 0.0180x + 0.0005$$

Calculator has:
 $b = 5.0047 E^{-4}$

c) Use the equation to predict the expected download time of a file that is 100 megabytes in size. (nearest hundredth)

$$= 0.0180(100) + 0.0005$$

$$= 1.8005 \text{ seconds}$$