SRiS – Chapter 10 Review B

1. CTE Teacher Mr. Gutsch had a dominant year in 2020, leading all SRHS teachers in cell phone throwing performance with a rating of 92.3 In 2021, Math teacher Mr. Bohn led all SRHS teachers in cell phone throwing performance with a rating of 95.2 Their ratings were similar, but answer the following questions to determine whose performance was actually better, relative to other teachers in the same year.

(a) In 2020 the mean cell phone throwing rating for all SRHS teachers was 50.7 with a standard deviation of 14.3 Calculate and interpret the *z*-score for Mr. Gutsch for the year 2020.

$$z = \frac{x - \text{mean}}{SD}$$

$$= \frac{92.3 - 50.7}{14.3}$$

$$= 2.91$$

(b) In 2021 the mean cell phone throwing rating for all SRHS teachers was 47.1 with a standard deviation of 16.4 Calculate and interpret the *z*-score for Mr. Bohn for the year 2021.

$$z = \frac{x - \text{mean}}{SD}$$

$$= \frac{95.2 - 47.1}{16.4}$$

$$= 2.93$$

(c) Based on your answers to parts (a) and (b), who had the more dominant year? Explain your reasoning.

Mr. Bohn had a (slightly) more dominant year – his z-score was higher, meaning he performed more standard deviations above the mean as compared to his peers.

2. You and your friends decide to start a fantasy BBSGM (Basketball-Soccer Grudge Match) league using three categories: points, rebounds and turnovers. Bigger values are better for points and rebounds, but not for turnovers. The table shows the values of these three variables in the 21 – 22 school year for Mr. Price and Mr. Patrick. The table also includes the mean and standard deviation of these variables for all of the players in the Friday BBSGM league.

Name	Points	Rebounds	Turnovers
Patrick	15.0	7.2	4.1
Price	14.7	5.6	3.2
Mean	8.7	6.8	2.8
SD	3.2	2.1	1.2

(a) Convert each of Mr. Patrick's *PERFORMANCES* into a *z*-score.

$z_P = \frac{15 - 8.7}{3.2} = 1.97$ $z_R = \frac{7.2 - 6.8}{2.1} = .19$ $z_T = \frac{4.1 - 2.8}{1.2} = 1.08$

(b) Convert each of Mr. Price's *PERFORMANCES* into a *z*-score.

$z_P = \frac{14.7 - 8.7}{3.2} = 1.88$ $z_R = \frac{5.6 - 6.8}{2.1} = -.57$ $z_T = \frac{3.2 - 2.8}{1.2} = .33$

(c) Which player is more valuable? Combine each player's z-scores to get an overall fantasy value. Remember that being below average is better for turnovers, so reverse the sign of the *z*-score for turnovers before combining.

Patrick: $1.97 + .19 - (1.08) = 1.08$

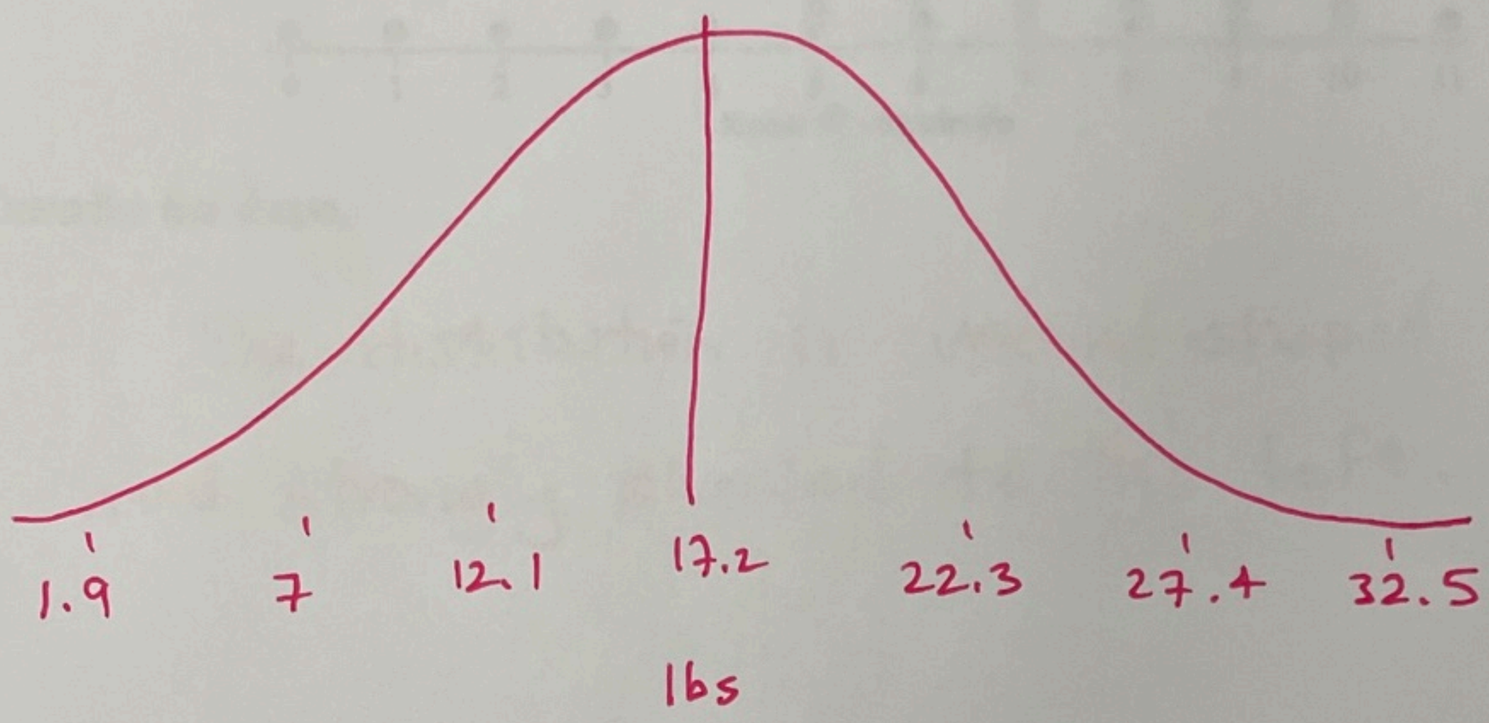
Price: $1.88 + (-.57) - (.33) = .98$

Patrick is (slightly) more valuable

3. For the last 50 years, the number of pounds of peppers grown by master gardener Mr. Courtemarche has grown is roughly normal with a mean of 17.2 pounds and a standard deviation of 5.1 pounds.

(a) Sketch a normal curve to model this distribution. Label the mean along with points 1, 2, and 3 standard deviations from the mean in each direction.

Mr. C.



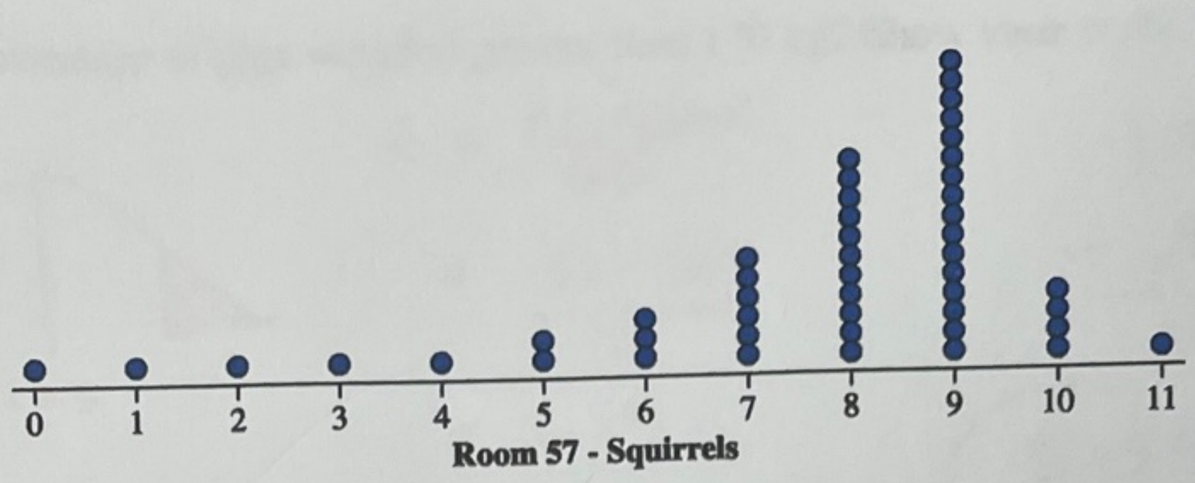
(b) Use your sketch from (a) to estimate the number of years in which Mr. Courtemarche grew between 12.1 and 17.2 pounds of peppers.

$P(12.1 < lbs < 17.2) = 34\%$

(c) Use your sketch from (a) to estimate the percentage of games number of years in which Mr. Courtemarche grew more than 22.3 pounds of peppers

$P(lbs > 22.3) = 16\%$

4. Here is a dotplot showing the distribution of number squirrels counted outside of Room 57 each day so far this semester. The mean of each of the 48 days is 7.56 and the standard deviation is 2.34



(a) Describe the shape.

The distribution is mound-shaped and strongly skewed to the left.

(b) Compare the range and the standard deviation.

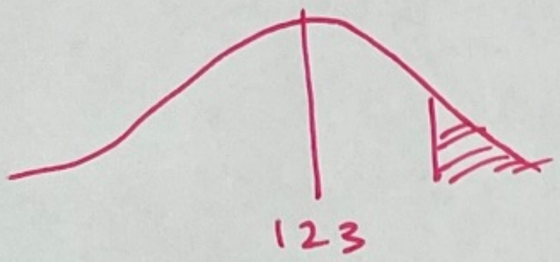
The range is about 11 and $11/6 \approx 1.8$ but the SD is 2.34 which means the data is more spread out than we expect if normally distributed.

(c) Based on your answers to (a) and (b), is the distribution roughly normal?

No - the data is too spread out and the shape is definitely non-normal

5. For the pigs at SRHS that Mrs. Piehl's took care of in 2020, the distribution of weights was roughly normal with a mean of 123 kg and a standard deviation of 17 kg.

(a) About what percentage of pigs weighed greater than 150 kg? Show your work.



$z = \frac{x - \text{mean}}{SD}$

$= \frac{150 - 123}{17}$

$= 1.59$

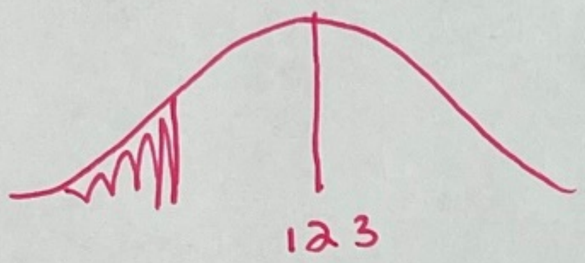
1.0000

− .9441

.0559

5.59%

(b) About what percentage of pigs weighed less than 100 kg? Show your work.



$z = \frac{x - \text{mean}}{SD}$

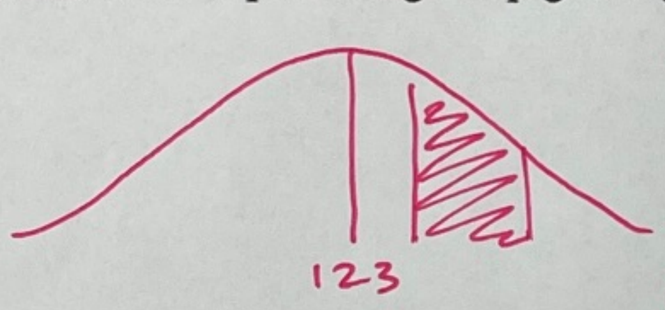
$= \frac{100 - 123}{17}$

$= -1.35$

.0885

8.85%

(c) About what percentage of pigs weighed between 130 and 140 kg? Show your work.



$z = \frac{140 - 123}{17}$

$= 1$

$z = \frac{130 - 123}{17}$

$= .41$

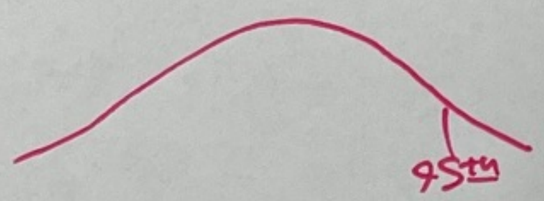
.8413

− .6591

.1822

18.22%

(d) Estimate the 95th percentile for pigs weight. Show your work.



$z = 1.645 = \frac{x - \text{mean}}{SD}$

$17(1.645) = \frac{x - 123}{17} \cdot 17$

$27.97 = x - 123$

$+123 \quad +123$

$x = 150.97 \text{ kg}$