

Out of 35 total points

$$\begin{aligned} 11:30 \\ \bar{x} &= 76.7 \\ s_x &= 17.9 \\ 26, 67, 81, 89, 96 \end{aligned}$$

$$\begin{aligned} 3:00 \\ \bar{x} &= 82.1 \\ s_x &= 14.2 \\ 56, 70, 83, 94, \\ &100 \end{aligned}$$

STA2023 Test Chapter 1-5  
Deb Howard (3-16)

Name Key

Show all work for partial credit including calculator keystrokes when used.

1. Valencia College records data about their students. Determine whether each variable is a categorical (C) or a quantitative variable (Q).

1 point each

- a.) # of Credit hours attempted
- b.) Cumulative GPA
- c.) Ethnicity
- d.) Gender
- e.) Declared major

Q  
Q  
C  
C  
C

2. The responses of a sample of 352 small-business owners who were asked whether their business has a website are given below.

Business Website	Frequency
No, unlikely in future	77 $\approx 22\%$
No, but plan to after 2017	25 $\approx 7\%$
No, but plan to in 2016	60 $\approx 17\%$
Yes, since 2015	46 $\approx 13\%$
Yes, since 2014 or earlier	144 $\approx 41\%$

Categorical

3 a.) What percent of businesses were unlikely to have a website in the future?

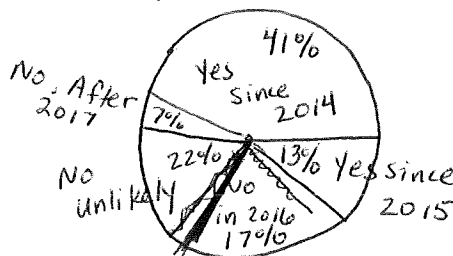
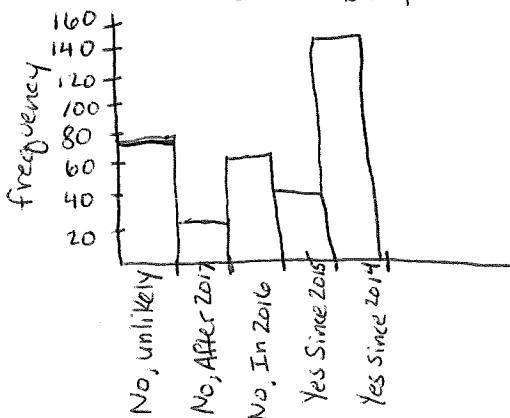
$$\frac{77}{352} = 0.21875 = 21.875\%$$

b.) Create an appropriate display for these data.

Use Pie or Bar Graph

Business website

Business website



3. A sample of 9 grade point averages for freshman are listed below.

2.8	1.8	4.0	3.8	2.4	2	0.9	3.6	1.8
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Quantitative

STAT  
CALC  
#1

$$\bar{x} = 2.56$$

$$s_x = 1.060660172$$

5# Summary

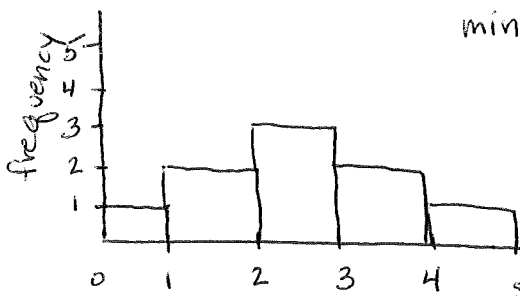
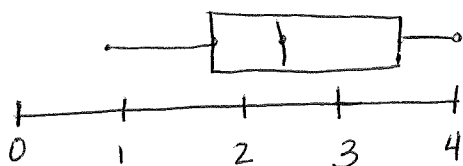
0.9, 1.8, 2.4, 3.7, 4

min, Q1, med, Q3, max

3 a.) Sketch an appropriate graph.

Use Box Plot or Histogram

GPA



GPA

1 b.) Describe the distribution in terms of shape.

mostly symmetric

if skewed use median and IQR

1 c.) Describe the distribution in terms of center.

$$\text{mean} = 2.56$$

if symmetric use mean and SD

1 d.) Describe the distribution in terms of spread.

$$\text{SD} = 1.060660172$$

$$\begin{aligned} \text{IQR} &= Q3 - Q1 \\ &= 3.7 - 1.8 \\ &= 1.9 \end{aligned}$$

3 e.) Calculate the lower and upper fences. Are there any outliers?

$$\begin{aligned} \text{left} &= Q1 - 1.5 * \text{IQR} \\ &= 1.8 - 1.5(1.9) \\ &= -1.05 \end{aligned}$$

No value to left  
So no outliers on left side

$$\begin{aligned} \text{right} &= Q3 + 1.5 * \text{IQR} \\ &= 3.7 + 1.5(1.9) \\ &= 6.55 \end{aligned}$$

No value to right  
So no outliers on right side

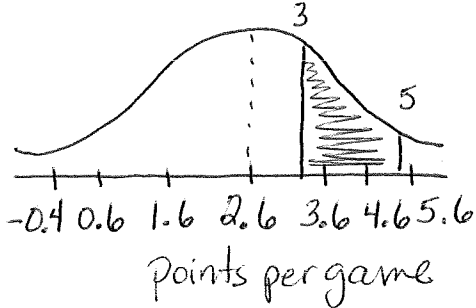
No

4. In the 2019 Kelly Cup Playoffs, the Orlando Solar Bears scored an average of 2.6 points per game with a stand deviation of 1.0 points.

a) What percentage of games would you expect the Bears to have scores between 3 and 5 points? Sketch the graph and include 3 standard deviations on either side of the mean. Shade the appropriate area. Show all work for credit. Write all 9 decimal digits. Do not round.

mean = 2.6  
SD = 1

5



$$z = \frac{\text{data} - \text{center}}{\text{SD}} = \frac{3 - 2.6}{1} = 0.4$$

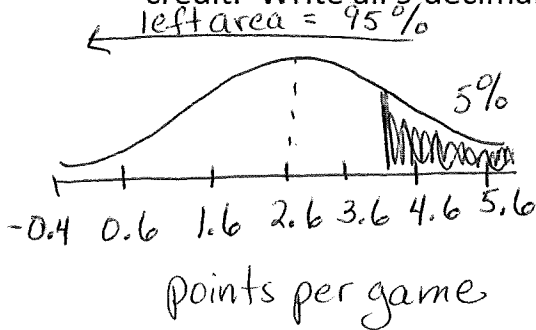
$$z = \frac{\text{data} - \text{center}}{\text{SD}} = \frac{5 - 2.6}{1} = 2.4$$

$$\text{normalcdf}(0.4, 2.4) = 0.3363807741$$

33.63807741%

b) How many points would you expect the Bears to score in their highest 5% of games? Make a fresh sketch shading the appropriate area. Show all work for credit. Write all 9 decimal digits. Do not round.

5



← left area = 95%

$$z = \text{invnorm}(0.95) = 1.644853626$$

$$\text{data} = z * \text{SD} + \text{center}$$

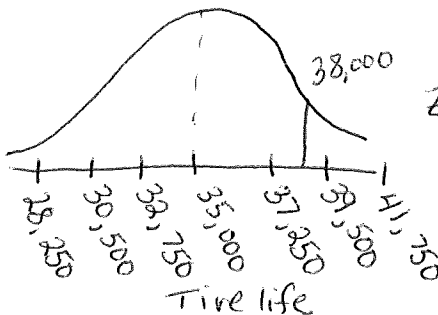
$$= 1.644853626(1) + 2.6$$

$$= 4.244853626 \text{ or more}$$

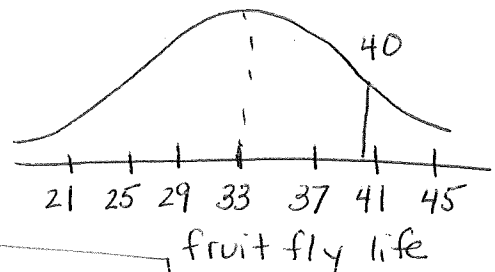
5. The life span for an automobile tire has a mean of 35,000 miles with a standard deviation of 2250 miles. The life span of a species of fruit fly has a mean of 33 days and a standard deviation of 4 days. Which life span is more unusual: a tire that lasts for 38,000 miles or fruit fly that lasts for 40 days? Explain.

5

tire  
mean = 35,000  
SD = 2250



fruit fly  
mean = 33  
SD = 4



$$z = \frac{38,000 - 35,000}{2250}$$

$$z = 1.3$$

$$z = \frac{40 - 33}{4}$$

$$z = 1.75$$

Fruit fly is more unusual since larger z score

