

200
~~100 points~~
 35 parts

Name: _____
 Show work accordingly to receive full credit.

(Round to the tenths place when appropriate)
 To answer some of the questions below, you need to first find the class midpoints.

1) Find all of the **class boundaries** for the 5th class.

$24.5 \leq 30.5$

L2 L1

	class	frequency	Class midpoints
1	1 - 6	2	3.5
2	7 - 12	3	9.5
3	13 - 18	10	15.5
4	19 - 24	12	21.5
5	25 - 30	3	27.5
6	31 - 36	2	33.5

2) What is $\sum f$ (give the numerical answer) 32

3) What is the **class width**?

6

4) What is the **cumulative frequency** of the 3rd class?

15

5) What is the **relative frequency** of the FOURTH class?

$12/32 = 37.5\%$

6) Find the **mean** of the data represented by the table above.

$\bar{X} = 18.7$

7) Find the standard deviation.

$S = 7.1$

by doing

1-var stats L1, L2

True/False

- T 8) A Resistant measure is not affected by outliers. True/False
- F 9) An outlier is a data value that falls very close to the median. True/False
- F 10) The variance is obtained by taking the rounded standard deviation and squaring it. True/False *should be unrounded*
- F 11) Probabilities are values greater than 1. True/False
- T 12) A Permutation helps us count how many ways something can happen when order is taken into account (in other words, order matters) True/False
- T 13) An outlier can have a dramatic effect on the scale of the histogram so that the true nature of the distribution is totally obscured. True/False

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Recruits for a police academy were required to undergo a test that measures their exercise capacity. Below is the sample data of their exercise capacity (in minutes) for 11 recruits. (round accordingly using the rounding rules we talked about in class)

10, 19, 20, 22, 25, 27, 30, 32, 33, 34, 34

14) Find the median of the data set. $\tilde{x} = 27$

15) Find the mean of the data set. $\bar{x} = 26$

16) Find the variance. $s^2 \approx 58.8$

17) Find the mode. $M = 34$

18) Is the distribution (for the data above) skewed to the left, skewed to the right, or is it symmetric? Explain how you determined this.

$$S_k = \frac{3(\bar{x} - \tilde{x})}{s} \approx -0.39$$

$$S_k < 0$$

Since mean < median < mode

Skewed to left

19) The 5 number summary for a set of data is:

Min: 55 Q1: 88 Q2: 147 Q3: 216 Max: 535

Using the 1.5 X IQR criterion, determine whether any outliers exist.

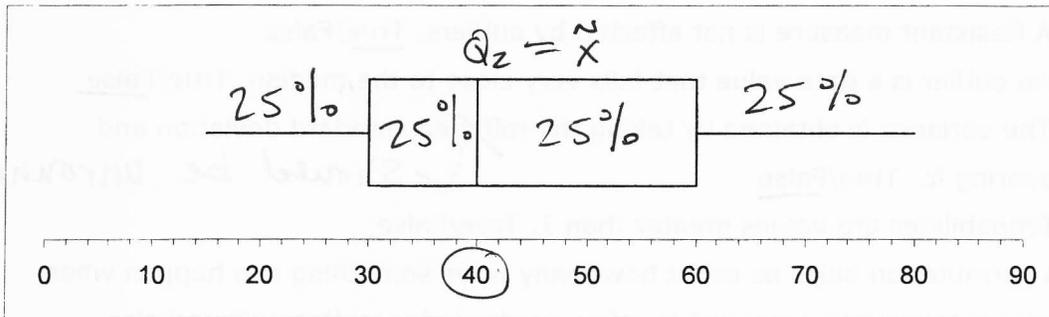
$$IQR = Q_3 - Q_1$$

$$Q_3 + 1.5 IQR = 408$$

$$Q_1 - 1.5 IQR = -104$$

so 535 must be the outlier.

20) Consider the boxplot displaying the amount of time (in minutes) it took 50 different students to answer a complicated math problem correctly. Use the graph to answer the questions below.



A. Based on the shape of the variable's distribution, what is the value of the median?

$$Q_2 = 40$$

B. What percentage of the students took longer than 60 minutes to answer the problem?

$$25\%$$

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21) Birth weights have a bell shaped distributed with a mean of 3418 grams and a standard deviation of 495 grams. Using the EMPIRICAL RULE, what is the approximate percentage of weights between 2428 and 4408.

$$\bar{x} + 2s = 4408 \quad \text{and} \quad \bar{x} - 2s = 2428$$

Since 4408 and 2428 are 2 sd away from the mean, 95% of data (weights) lie between the ^{two} numbers.

22) The heights of Kenneth Cole cologne bottles have an average of 4.75 inches, and a standard deviation of .01 inch. The heights of Armani cologne bottles have an average of 5.1 inches, and a standard deviation of .017 inch. Calculate the Z score for a Kenneth Cole bottle that is 4.725 inches tall and also calculate the Z score for an Armani bottle that is 5.12 inches tall.

Which is the unusual z-score? (round z-scores to 2 places after decimal)

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

KC $z = \frac{4.725 - 4.75}{.01} = -2.50$ unusual

AC $z = \frac{5.12 - 5.1}{.017} = 1.18$

The table below shows the soft drinks preferences of people in three age groups.

	Coke K	Pepsi P	Store Brand Cola S	Total
A Under 21	40	25	20	85
B Age 21 - 40	35	20	30	85
C Over 40	20	30	35	85
Total	95	75	85	255

If one of the 255 subjects is randomly selected, find the probability that

(Keep your answers in fraction form)

23) The person is under 21 years of age or drinks the Store Brand Cola

$$P(A \text{ or } S) = P(A) + P(S) - P(A \cap S) = \frac{85}{255} + \frac{85}{255} - \frac{20}{255} = \frac{150}{255}$$

24) The person is over 40 years of age given that they drink Pepsi.

$$P(C | P) = \frac{30}{75}$$

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25) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing a *queen or a king*? (Round answer to the thousandths place)

$$P(Q+K) = P(Q) + P(K) - P(Q \text{ and } K)$$

$$\frac{4}{52} + \frac{4}{52} - 0 = 8/52 \quad \text{= 154}$$

26) Based on your answer **is it unusual** that you will draw a queen or a king? Explain using the rule for unusual.

$0.154 > 0.05$ so Not unusual.

27) Are the two events disjoint (in other words are the two events mutually exclusive)?

Yes, since $P(Q \text{ and } K) = 0$
 \Rightarrow Q and K can't happen @ the same time

28) There are 45 members on the board of directors for a local private hospital.

a. If they must elect a chairperson, first vice chairperson, second vice chairperson, and secretary, **how many** different slates of candidates are possible?

$$45P_4 = 3,575,880$$

b. If they must form an ethics subcommittee of four members **how many** different subcommittees are possible?

$$45C_4 = 148,995$$

FILL IN THE BLANK:

29) The median is a resistant measure of center.

30) The IQR is a resistant measure of spread.

31) The notation used for the sample mean is \bar{x}

32) The notation used for the population standard deviation is 6

33) The notation used for the sample standard deviation is S