

MAT1080 Midterm Part 1**NAME:** _____**Due before Monday, 3/18, 5:00PM.**

Scan to a PDF and submit on D2L. Some work must be shown. If the work is mostly plugging numbers into a calculator, you must at least show the equation that would be used if doing it by hand. Even if the answer seems obvious, some justification must be provided. If ever doubtful how much work must be shown, ask.

Find the mean of the data summarized in the given frequency distribution.

1) The heights of a group of professional basketball players are summarized in the frequency distribution below. Find the mean height. Round to one decimal place.

Height (in.)	Frequency
70 – 71	1
72 – 73	8
74 – 75	13
76 – 77	8
78 – 79	15
80 – 81	6
82 – 83	3

(SHOW WORK) FINAL ANSWER:

Solve the problem. Round results to the nearest hundredth.

2) The mean of a set of data is -2.91 and its standard deviation is 3.88
Find the z score for a value of 2.80

(SHOW WORK) FINAL ANSWER:

Find the variance for the given sample data. Round your answer to one more decimal place than the original data.

3) The weights (in ounces) of 10 cookies are shown.

1.4 0.99 1.37 0.58 0.68 0.57 1.1 0.96 1.2 1.27

(SHOW WORK) FINAL ANSWER:

Find the mode(s) for the given sample data.

4) The speeds (in mi/h) of the cars passing a certain checkpoint are measured by radar. The results are shown below.

41.8	41.4	44.4	43.7	45.3
45.3	41.4	40.0	47.8	43.7
41.8	40.0	43.7	39.7	41.4
44.1	44.1	44.4	48.8	41.8

(SHOW WORK) FINAL ANSWER:

Find the range for the given sample data.

5) Jeremy called eight appliance stores and asked the price of a specific model of microwave oven.

The prices quoted are listed below:

\$116	\$479	\$144	\$606
\$369	\$252	\$317	\$492

(SHOW WORK) FINAL ANSWER:

Find the standard deviation for the given sample data. Round your answer to one more decimal place than is present in the original data.

6) Listed below are the amounts of time (in months) that the employees of a restaurant have been working at the restaurant.

2	3	6	17	22	40	54	73	101	122
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(SHOW WORK) FINAL ANSWER:

Find the indicated probability.

7) The manager of a bank recorded the amount of time each customer spent waiting in line during peak business hours one Monday. The frequency table below summarizes the results.

Wait Time (minutes)	Number of Customers
0-3	9
4-7	10
8-11	12
12-15	4
16-19	4
20-23	2
24-27	2

If we randomly select one of the customers represented in the table, what is the probability that the waiting time is at least 12 minutes OR between 8 and 15 minutes? (Here, the word between includes the endpoints, think about what “at least” means)

(SHOW WORK) FINAL ANSWER:

Find the indicated probability.

8) Refer to the table which summarizes the results of testing for a certain disease.

	Positive Test Result	Negative Test Result
Subject has the disease	111	4
Subject does not have the disease	11	172

If a result is negative, what is the probability that it is a false negative (test indicates the person does not have the disease when in fact they do)?

(SHOW WORK) FINAL ANSWER:

Find the indicated probability. Express your answer as a simplified fraction.

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

	cola	root beer	lemon-lime
under 21 years of age	40	25	20
between 21 and 40	35	20	30
over 40 years of age	20	30	35

If one of the 255 subjects is randomly selected, find the probability that the person is over 40 years of age **given that** they drink root beer.

(SHOW WORK) FINAL ANSWER:

Find the indicated probability.

10) If you pick a card at random from a well shuffled deck, what is the probability that you get a face card or a heart? (face card={Jack,Queen,King}, hearts are one of four suits, each suit has 13 cards)

(SHOW WORK) FINAL ANSWER:

Provide an appropriate response.

11) In a game, you have a $1/36$ probability of winning \$85 and a $35/36$ probability of losing \$4. What is your expected value?

(SHOW WORK) FINAL ANSWER:

Find the indicated probability.

12) A multiple choice test has 12 questions each of which has 5 possible answers, only one of which is correct. If Judy, who forgot to study for the test, guesses on all questions, what is the probability that she will answer exactly 3 questions correctly?

(SHOW WORK) FINAL ANSWER:

Solve the problem.

13) According to a college survey, 22% of all students work full time. Find the mean for the number of students who work full time in samples of size 16.

HINT: We want a mean of the binomial probability distribution, which is a number which will be in the range 0-16. We do NOT want a probability using the binomial formula.

(SHOW WORK) FINAL ANSWER:

Find the indicated probability. Round to three decimal places.

14) A machine has 11 identical components which function independently. The probability that a component will fail is 0.2. The machine will stop working if more than three components fail. Find the probability that the machine will be working.

(hint, think about what “more than” means, and depending on your technology think about if you need to complement the expression first).

(SHOW WORK) FINAL ANSWER:

Solve the problem.

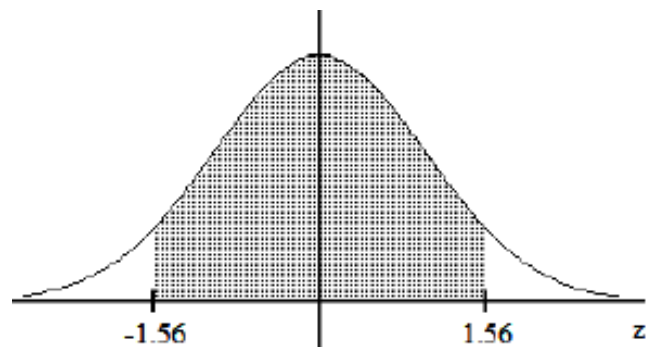
15) A final exam in Math 160 has a mean of 73 with standard deviation 7.8. If 24 students are randomly selected, find the probability that the mean of their test scores is less than 70.

(SHOW WORK) FINAL ANSWER:

Find the area of the shaded region. The graph depicts the standard normal distribution with mean 0 and standard deviation 1.

16)

(SHOW WORK) FINAL ANSWER:



For problems 17 and 18, assume that cans of coke are filled so that the actual amounts are normally distributed with a mean of 12.00 oz and a standard deviation of 0.12 oz.

(17) Find the probability that a single can of coke has at least 12.06 oz. Express your answer as a decimal rounded to four decimal places.

(SHOW WORK) FINAL ANSWER:

(18) Find the probability that a case of 36 cans have a mean of at least 12.06 oz. Express your answer as a decimal rounded to four decimal places.

HINT: think of a sampling distribution for samples of 36 and first find the standard error, which is the standard deviation of a sampling distribution.

(SHOW WORK) FINAL ANSWER:

Find the mean, μ , for the binomial distribution which has the stated values of n and p . Round the answer to the nearest tenth.

19) $n = 38$; $p = 3/5$

(SHOW WORK) FINAL ANSWER:

Assume that a procedure yields a binomial distribution with a trial repeated n times. Use the binomial probability formula to find the probability of x successes given the probability p of success on a single trial. Round to three decimal places.

20) $n = 5$, $x = 2$, $p = 0.70$

(SHOW WORK) FINAL ANSWER: