Chapters 1–10 Final Exam Review **Statistics MATH 1342 – Instructor: David Katz**
Summer 2009

This post–test analysis lists the most frequently missed questions from the tests over chapters 1–7.

Remember: the questions on the final exam can come in any order. Be sure to study these questions and similar ones in a random order to best prepare for the final exam!

THE FINAL EXAM WILL ALSO HAVE ABOUT 9–10 QUESTIONS FROM CHS. 8–10. This material is NOT in this review packet. Some important topics to review are:

1) Compute a predicted value using y–hat (see p.526 and p.546).
2) Construct an x–y scatter plot (section 10–2).
3) Construct a linear regression equation (section 10–3; hint: use **LinRegTTest** on your TI calculator).
6) Complete hypothesis test using test statistic and critical value for matched pairs of data (section 9–4).

The final exam will have 25 questions. Fifteen or so of the questions will be chosen from the list below.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem. Note this problem comes from Section 5–3.

1) An airline estimates that 94% of people booked on their flights actually show up. If the airline books 60 people on a flight for which the maximum number is 58, what is the probability that the number of people who show up will exceed the capacity of the plane?
A) 0.0935 B) 0.1179 C) 0.0244 D) 0.2940

Answer: B
Objective: (4.3) Solve Apps: Find Probability of at Least/at Most x Successes

Determine if the outcome is unusual. Consider as unusual any result that differs from the mean by more than 2 standard deviations. Note this problem comes from Section 5–4.

2) According to AccuData Media Research, 36% of televisions within the Chicago city limits are tuned to "Eyewitness News" at 5:00 pm on Sunday nights. At 5:00 pm on a given Sunday, 2500 such televisions are randomly selected and checked to determine what is being watched. Would it be unusual to find that 931 of the 2500 televisions are tuned to "Eyewitness News"?
A) No, because 931 is between 852 and 948
B) Yes, because 931 is greater than 876
C) Yes, because 931 is less than 948
D) No, becaue 931 is greater than 900

Answer: A
Objective: (4.4) Determine if Outcome is Unusual (Y/N)

Find the minimum sample size you should use to assure that your estimate of $\hat{p}$ will be within the required margin of error around the population p. Note this problem comes from Section 7–2.

3) Margin of error: 0.007; confidence level: 99%; $\hat{p}$ and $\hat{q}$ are unknown
A) 33,830 B) 135,319 C) 541,276 D) 33,829

Answer: A
Objective: (6.2) Find Required Sample Size (p Hat Unknown)

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p. Note this problem comes from Section 7–2.

4) Of 133 adults selected randomly from one town, 26 of them smoke. Construct a 99% confidence interval for the true percentage of all adults in the town that smoke.

A) 12.8% < p < 26.3% B) 11.5% < p < 27.6% C) 10.7% < p < 28.4% D) 13.9% < p < 25.2%

Answer: C

Objective: (6.2) Construct Confidence Interval for p

Use the given degree of confidence and sample data to find a confidence interval for the population standard deviation σ. Assume that the population has a normal distribution. Note this problem comes from Section 7–5.

5) The daily intakes of milk (in ounces) for ten randomly selected people were:

19.2 27.5 24.2 29.6 21.5

22.2 21.4 15.3 22.1 31.1

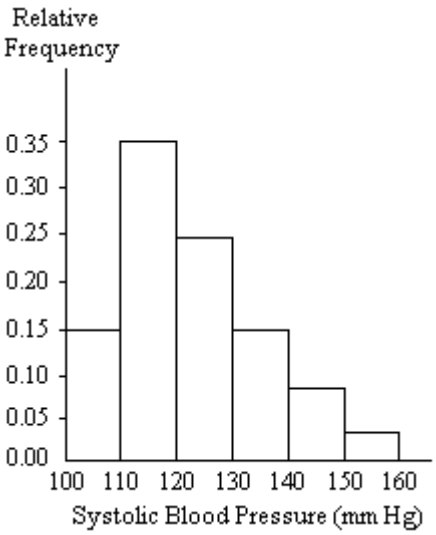
Find a 99 percent confidence interval for the population standard deviation σ.

A) (2.88, 9.86) B) (0.78, 3.18) C) (2.98, 10.98) D) (2.98, 9.86)

Answer: C

Objective: (6.5) Solve Apps: Find Confidence Interval

A nurse recorded the blood pressure of each person who visited her clinic in the the relative –frequency histogram below. The blood pressure readings were given to the nearest whole number.



6) Identify the center of the third class in the histogram from the last question.

A) 120 B) 124 C) 130 D) 125

Answer: D

Objective: (2.3) Use Histogram to Find Center/Class Width/Percentage

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

7) A company had 80 employees whose salaries are summarized in the frequency distribution below. Find the mean salary.

Salary ($)	Employees
5,001–10,000	11
10,001–15,000	16
15,001–20,000	16
20,001–25,000	18
25,001–30,000	19

A) $17,500 B) $20,488.05 C) $18,625.50 D) $16,762.95

Answer: C
Objective: (3.2) Find Mean of Frequency Distribution

Find the standard deviation of the data summarized in the given frequency distribution.

8) A company had 80 employees whose salaries are summarized in the frequency distribution below. Find the standard deviation.

Salary	Employees
5,001 – 10,000	14
10,001 – 15,000	11
15,001 – 20,000	17
20,001 – 25,000	16
25,001 – 30,000	22

A) s = 7236.7 B) s = 8032.7 C) s = 7815.6 D) s = 7598.5

Answer: A
Objective: (3.3) Find Standard Deviation of Frequency Distribution

Solve the problem.

9) A company performs quality control on its juice bottles. It finds that the volumes of juice in its 16 ounce bottles have a mean of 16.3 ounces and a standard deviation of 0.08 ounces. Estimate the minimum and maximum "usual" volumes.

A) 16.06 ounces, 16.54 ounces B) 16.22 ounces, 16.38 ounces
C) 16.09 ounces, 16.19 ounces D) 16.14 ounces, 16.46 ounces

Answer: D
Objective: (3.3) Use Range Rule of Thumb

Use the empirical rule to solve the problem.

10) The systolic blood pressure of 18–year–old women is normally distributed with a mean of 120 mmHg and a standard deviation of 12 mmHg. What percentage of 18–year–old women have a systolic blood pressure between 96 mmHg and 144 mmHg?

A) 95% B) 99.7% C) 99.9% D) 68% E) 100%

Answer: A
Objective: (3.3) Use Empirical Rule

Find the indicated probability.

11) In a blood testing procedure, blood samples from 4 people are combined into one mixture. The mixture will only test negative if all the individual samples are negative. If the probability that an individual sample tests positive is 0.1, what is the probability that the mixture will test positive?

A) 1.00 B) 0.0100 C) 0.344 D) 0.000100

Answer: C
Objective: (4.5) Find Probability of "At Least One"

12) 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.

A) $\frac{6}{17}$ B) $\frac{5}{17}$

C) $\frac{2}{5}$ D) None of the above is correct.

Answer: C
Objective: (4.5) Use Table to Find Conditional Probability

Solve the problem.

13) Suppose you buy 1 ticket for $1 out of a lottery of 1,000 tickets where the prize for the one winning ticket is to be $500. What is your expected value?

A) –$0.50 B) $0.00 C) –$0.40 D) –$1.00

Answer: A
Objective: (5.2) Find Expected Value

Determine whether the given procedure results in a binomial distribution. If not, state the reason why.

14) Choosing 5 people (without replacement) from a group of 39 people, of which 15 are women, keeping track of the number of men chosen.

A) Procedure results in a binomial distribution.
B) Not binomial: there are too many trials.
C) Not binomial: there are more than two outcomes for each trial.
D) Not binomial: the trials are not independent.

Answer: D
Objective: (5.3) Det if Procedure Results in Binomial Distribution

Find the indicated probability.

15) In a certain college, 33% of the physics majors belong to ethnic minorities. If 10 students are selected at random from the physics majors, what is the probability that no more than 6 belong to an ethnic minority?

A) 0.9846 B) 0.913 C) 0.9815 D) 0.0547

Answer: C
Objective: (5.3) Solve Apps: Find Probability of at Least/at Most x Successes

In this binomial problem, use the given values of n and p to find the minimum usual value and the maximum usual value.

16) $n = 441, p = \frac{2}{3}$

A) Minimum: 274.2; maximum: 313.8
B) Minimum: 313.8; maximum: 274.2
C) Minimum: 284.1; maximum: 303.9
D) Minimum: 280; maximum: 308

Answer: A
Objective: (5.4) Find Min/Max Value for Binomial Distribution

Solve the problem.

17) In a certain town, 41% of voters favor a given ballot measure. For groups of 22 voters, find the variance for the number who favor the measure.

A) 9.02 B) 5.32 C) 2.31 D) 28.32

Answer: B
Objective: (5.4) Solve Apps: Standard Deviation for Binomial Distribution

If Z is a standard normal variable, find the probability.

18) The probability that Z is greater than –1.82

A) –0.0344 B) 0.0344 C) 0.9656 D) 0.4656

Answer: C
Objective: (6.2) Use Standard Normal Distribution

Solve the problem.

19) Human body temperatures are normally distributed with a mean of 98.20°F and a standard deviation of 0.62°F. Find the temperature that separates the top 7% from the bottom 93%.

A) 99.12°F B) 98.40°F C) 97.28°F D) 98.78°F

Answer: A
Objective: (6.3) Find Percentile/Quartile

20) The serum cholesterol levels for men in one age group are normally distributed with a mean of 178.3 and a standard deviation of 40.6. All units are in mg/100 mL. Find the two levels that separate the top 9% and the bottom 9%.

A) 161.7 mg/100mL and 194.9 mg/100mL
B) 165.3 mg/100mL and 191.29 mg/100mL
C) 123.9 mg/100mL and 232.7 mg/100mL
D) 107.7 mg/100mL and 248.9 mg/100mL

Answer: C
Objective: (6.3) Find Percentile/Quartile

Find the indicated probability.

21) The lengths of human pregnancies are normally distributed with a mean of 268 days and a standard deviation of 15 days. What is the probability that a pregnancy lasts at least 300 days?

A) 0.0179 B) 0.9834 C) 0.4834 D) 0.0166

Answer: D
Objective: (6.3) Solve Apps: Find Probability for Nonstandard Normal Distribution

Solve the problem.

22) Assume that women's heights are normally distributed with a mean of 63.6 inches and a standard deviation of 2.5 inches. If 90 women are randomly selected, find the probability that they have a mean height between 62.9 inches and 64.0 inches.

A) 0.1739 B) 0.9318 C) 0.7248 D) 0.0424

Answer: B
Objective: (6.5) Find Probability for Sample Mean I

23) Assume that women's heights are normally distributed with a mean of 63.6 inches and a standard deviation of 2.5 inches. If 90 women are randomly selected, find the probability that they have a mean height between 62.9 inches and 64.0 inches.

A) 0.9318 B) 0.1739 C) 0.7248 D) 0.0424

Answer: A
Objective: (6.5) Find Probability for Sample Mean I

24) For women aged 18–24, systolic blood pressures (in mm Hg) are normally distributed with a mean of 114.8 and a standard deviation of 13.1. If 23 women aged 18–24 are randomly selected, find the probability that their mean systolic blood pressure is between 119 and 122.

A) 0.0577 B) 0.0833 C) 0.9341 D) 0.3343

Answer: A
Objective: (6.5) Find Probability for Sample Mean I

Find the margin of error for the 95% confidence interval used to estimate the population proportion.

25) In a clinical test with 2422 subjects, 50% showed improvement from the treatment.

A) 0.0222 B) 0.0267 C) 0.0198 D) 0.0168

Answer: C
Objective: (7.2) Find Margin of Error

Solve the problem.

26) In a certain population, body weights are normally distributed with a mean of 152 pounds and a standard deviation of 26 pounds. How many people must be surveyed if we want to estimate the percentage who weigh more than 180 pounds? Assume that we want 96% confidence that the error is no more than 2 percentage points.

A) 923 B) 2001 C) 1267 D) 2628

Answer: C
Objective: (7.2) Beyond the Basics: Est Population Proportion

Find the margin of error.

27) 95% confidence interval for μ; $n = 51$; $\bar{x} = 394$; $s = 201$

A) 38.8 B) 2.7 C) 56.5 D) 5.7

Answer: C
Objective: (7.4) Find Margin of Error