

Math 3 Final Exam Study Guide

Sorry for the lack of depth!! Nobody in our group is in Math 3, so we weren't sure what you guys covered in class. If it helps, here's a detailed Enhanced Math 3 study guide:

<https://drive.google.com/file/d/1NzmGRX0xGuGx4c-zYabk8rMLphsnFda3/view?usp=sharing>

Unit 5: Exponentials and Logs

Steps to Graphing a Logarithmic Function

RECALL: A log function is the inverse of an exponential function.

$$f^{-1}(x) = \log_b x \qquad f(x) = b^x$$

RECALL: If one point on a function is (x, y), the coordinate on the inverse function is (y, x).

$$\text{Point on } f(x): (0, 1) \qquad \text{Point on } f^{-1}(x): (1, 0)$$

STEP 1: Write the exponential form of the log function.

$$\log_b x \rightarrow b^x$$

STEP 2: Plug in three different x-values for the exponential function and find three points.

$$f(x) = b^x$$

$x = -1$	$y = \frac{1}{b}$	$(-1, \frac{1}{b})$
$x = 0$	$y = 1$	$(0, 1)$
$x = 1$	$y = b$	$(1, b)$

STEP 3: Reverse the x and y coordinates for these three points to find the coordinates for the logarithmic function.

$$(-1, \frac{1}{b}) \rightarrow (\frac{1}{b}, -1)$$

$$(0, 1) \rightarrow (1, 0)$$

$$(1, b) \rightarrow (b, 1)$$

STEP 4: Plot points.

Tips for Graphing a Natural Log Function

1) REMEMBER THESE COORDINATES:

e^x	$\ln(x)$
$(-1, \frac{1}{b})$	$(-1, \frac{1}{b})$
$(-1, \frac{1}{b})$	$(-1, \frac{1}{b})$
$(-1, \frac{1}{b})$	$(-1, \frac{1}{b})$

2) REMEMBER THESE VALUES (so you can plot points on a graph):

$$e \approx 2.718 \quad \frac{1}{e} \approx 0.378$$

3) When applying transformations to a natural log function, simply apply the transformations to (x, y).

Ex: Horizontal Translation

Original: $f(x) = \ln(x)$

(x, y)

Transformed: $f(x) = \ln(x - h)$

$(x + h, y)$

Ex: Vertical Translation

Original: $f(x) = \ln(x)$

(x, y)

Transformed: $f(x) = \ln(x) + k$

$(x, y + k)$

Ex: Reflection across x-axis

Original: $f(x) = \ln(x)$

(x, y)

Transformed: $f(x) = -\ln(x)$

$(x, -y)$

Ex: Reflection across y-axis

Original: $f(x) = \ln(x)$

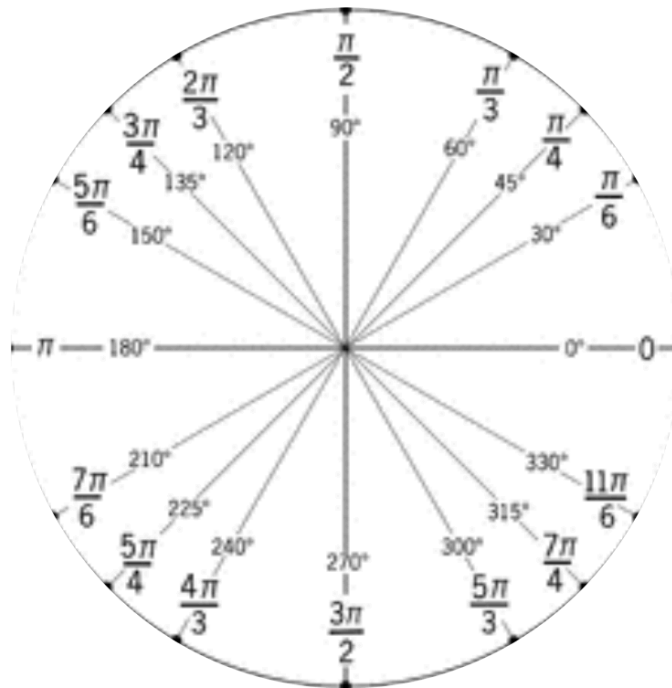
(x, y)

Transformed: $f(x) = \ln(-x)$

$(-x, y)$

Unit 6: Trigonometry

Unit Circle



$$\text{degrees} = \text{radians} \times \frac{180}{\pi}$$

Unit 7: Statistics

Confidence Intervals

Khan Academy Confidence Intervals

Confidence Interval: How to Find a Confidence Interval: The Easy Way!

[Probability and Statistics](#) > [How to Find a Confidence Interval](#)

If you're just beginning statistics, you'll probably be finding confidence intervals using the normal distribution (see #3 below). But in reality, most confidence intervals are found using the t-distribution (especially if you are working with small samples). If you aren't sure which technique you should be looking at, start with #1 below (how to find a confidence interval for a sample).

Contents (Click to Skip to Section)

- [What is a Confidence Interval?](#)

How to Find a Confidence Interval by Hand:

1. [How to Find a Confidence Interval for a Sample \(T-Distribution\)](#)
2. [How to Find a Confidence Interval for a Sample \(Example 2\)](#)
3. [How to Find a Confidence Interval with the Normal Distribution / Z-Distribution](#)
4. [How to Find a Confidence Interval for a Proportion](#)
5. [How to Find a Confidence Interval for Two Populations \(Proportions\)](#)

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[AP® Statistics >](#) **CONFIDENCE INTERVALS**

- Introduction to confidence intervals
- Confidence intervals and margin of error**
- Confidence interval simulation
- Interpreting confidence level example
- Interpreting confidence levels and confidence intervals

$A \cap B$
 $n=100$
 $\hat{p} = 0.54$
 $\hat{p} = 0.58$

$p = \text{prop that support A}$
What is the prob that $p = 0.54$ is within 2σ of $p^* \approx 95\%$

There is a 95% prob that p is within 2σ of p^* with 95% conf between 2 σ's

$$SE_{\hat{p}} = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = \sqrt{\frac{(0.54)(0.46)}{100}} \approx 0.05$$

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Next tutorial
[Confidence intervals for ...](#)

Confidence intervals and margin of

Calculating Z-Score

Z-Score: Definition, Formula and Calculation

Contents (General):

1. What is a Z-Score?
2. Z Score Formulas.
3. How to Calculate a Z-Score.
4. More on Z scores and Standard Deviations.
5. How Is It Used in Real Life?

Contents (Technology):

1. How To Find a Z-Score on the TI-89.
2. How to Find a Z-Score in Excel.
3. How to find a critical z-value on the TI-83.

1. What is a Z-Score?

Data Distribution

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AP® STATISTICS > MODELING
DATA DISTRIBUTIONS

Z-scores

- Normal distribution problem: z-scores (from ck12.org)
- Practice: Z-scores 1
- Comparing with z-scores
- Practice: Comparing with z-scores
- Z-scores-problem

Next tutorial
Effects of linear transfer...

3. The grades on a statistics test form for a high school are normally distributed with $\mu = 81$ and $\sigma = 6.5$. Consider the z-scores for each of the following scores given. Show and label a sketch for each example.

(a) 46
(b) 54
(c) 98
(d) 100

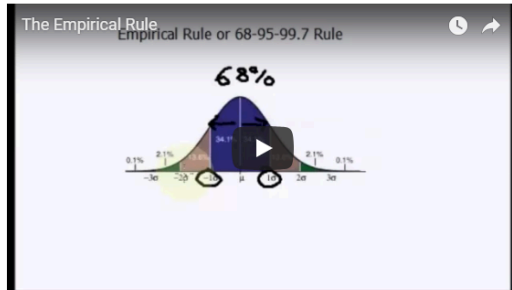
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Studying for a test? Prepare with these 6 lessons on Modeling data distributions.

Normal distribution problem: z-scores (from ck12.org)

Empirical Rule

Watch the video or read the article below:



Definition of the Empirical Rule

The empirical rule states that for a normal distribution, nearly all of the data will fall within three standard deviations of the mean. The empirical rule can be broken down into three parts: