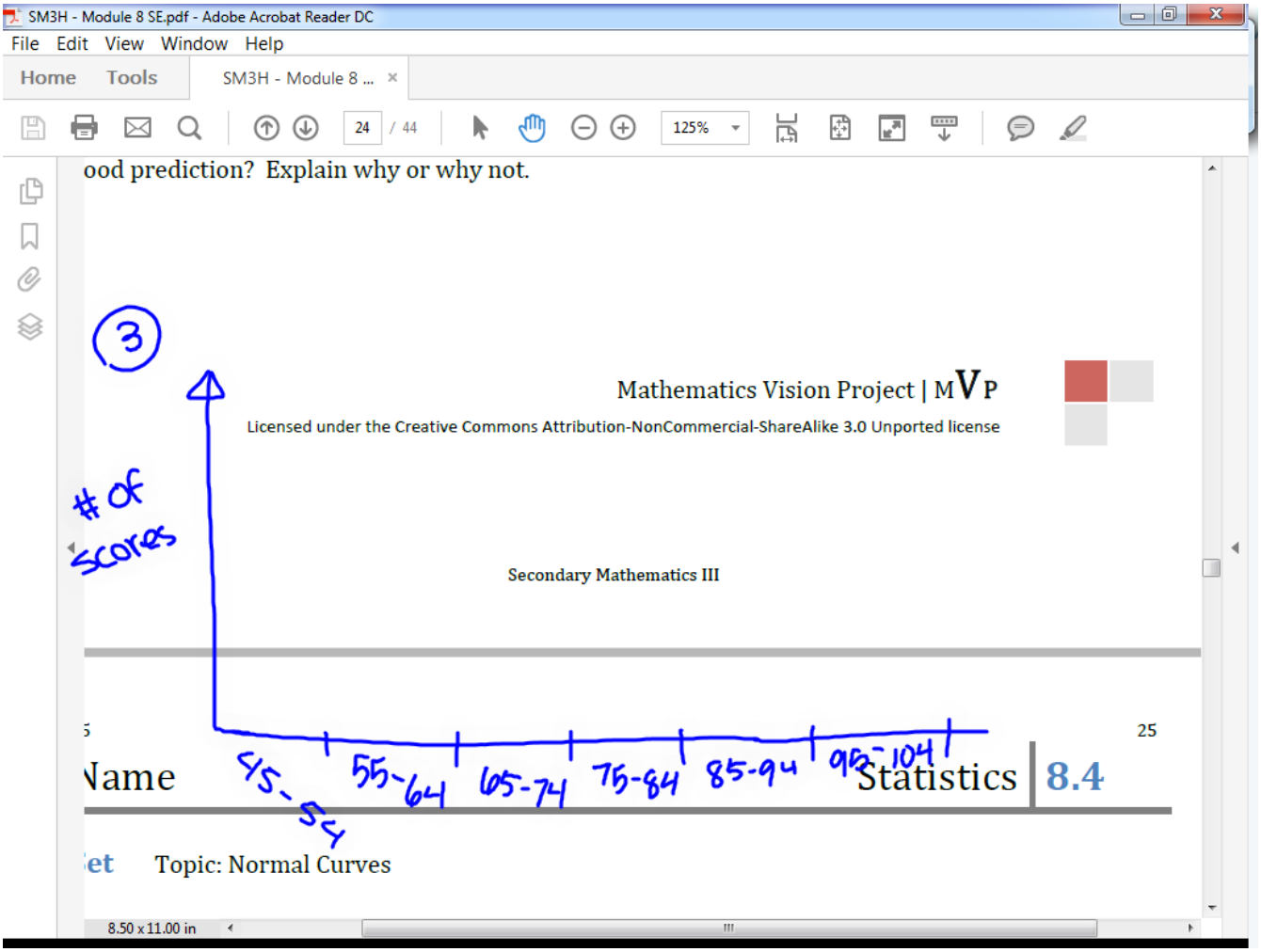
Questions on 8.4 HW? Quiz today...

Feb 7-1:31 PM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ood prediction? Explain why or why not.
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# of scores
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Secondary Mathematics III
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Statistics | 8.4
et Topic: Normal Curves
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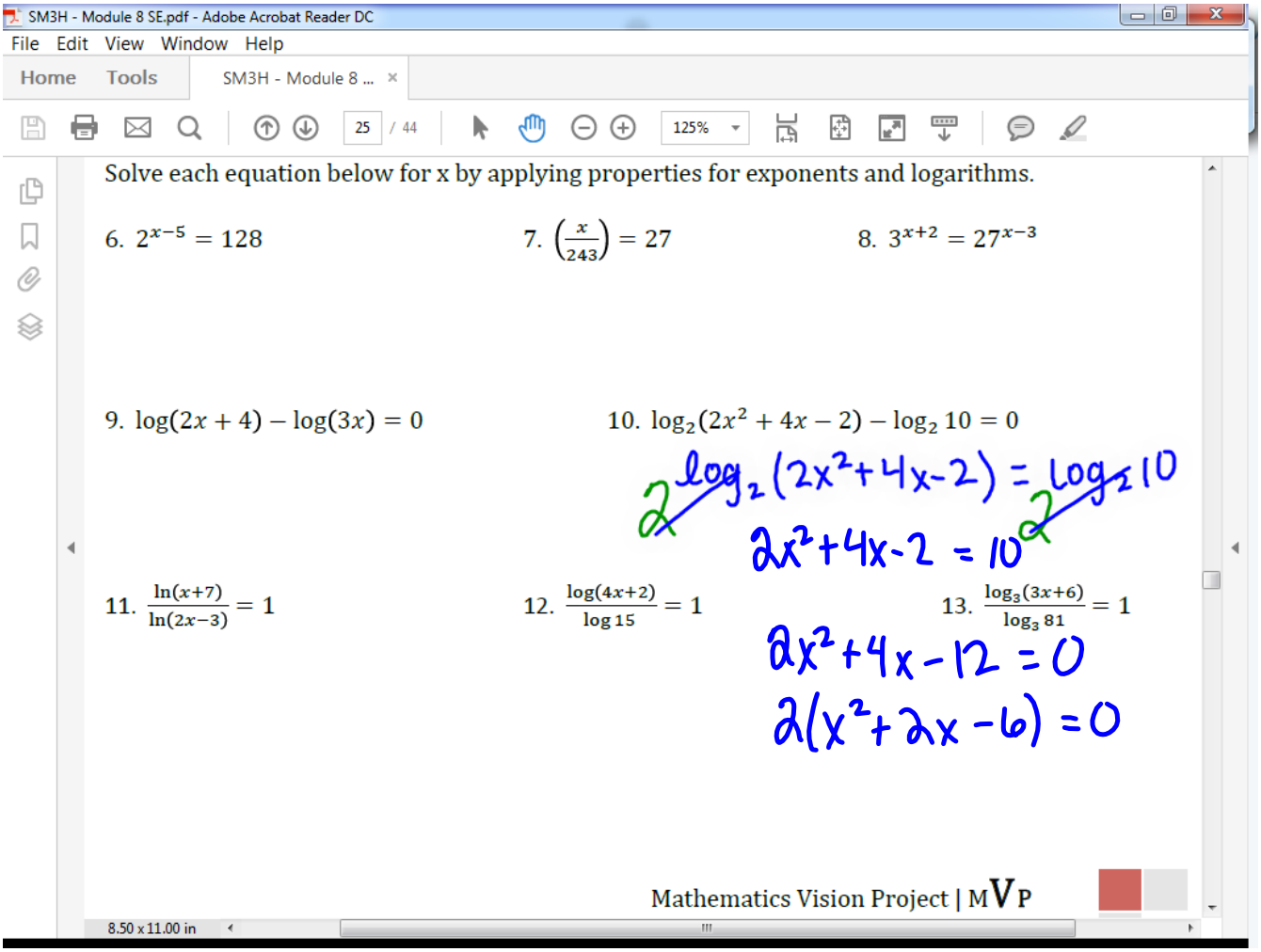
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Solve each equation below for x by applying properties for exponents and logarithms.
6. $2^{x-5} = 128$
7. $\left(\frac{x}{243}\right) = 27$
8. $3^{x+2} = 27^{x-3}$
9. $\log(2x+4) - \log(3x) = 0$
10. $\log_2(2x^2+4x-2) - \log_2 10 = 0$
$\log_2(2x^2+4x-2) = \log_2 10$
$2x^2+4x-2 = 10$
11. $\frac{\ln(x+7)}{\ln(2x-3)} = 1$
12. $\frac{\log(4x+2)}{\log 15} = 1$
13. $\frac{\log_3(3x+6)}{\log_3 81} = 1$
$2x^2+4x-12 = 0$
$2(x^2+2x-6) = 0$
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QUIZ

&

SAGE REVIEW PACKET:

-Work on #16-25 today

Apr 3-1:11 PM

8.4 Whoa! That's Weird!

A Practice Understanding Task

Each of the stories below are based upon normal distributions. Rank order these stories from most unusual to most average. (1 is the most unusual, 6 is the most average.) In each case, explain your ranking.

A. The number of red loops in a box of Tutti-Frutti-O's is normally distributed with mean of 800 loops and standard deviation 120. Tony bought a new box, opened it, and counted 1243 red loops. (It didn't really matter because all the colors are the same flavor anyway.)

Rank 3 Explanation: $z = 3.69$

B. The weight of house cats is normally distributed with a mean of 10 pounds and standard deviation 2.1 pounds. My cat, Big Boy, weighs 6 pounds.

Rank 4 Explanation: $z = -1.90$

C. The lifetime of a battery is normally distributed with a mean life of 40 hours and a standard deviation of 1.2 hours. I just bought a battery and it died after just 20 hours

Rank 1 Explanation: $z = -16.67$

D. The amount that a human fingernail grows in a year is normally distributed with a mean growth of 3.5 cm and a standard deviation of 0.63 cm. My neighbor's thumbnail grew all year without breaking and it is 4.6 cm long with stars and stripes painted on it.

Rank 5 Explanation: $z = 1.75$

E. My little brother was digging in the garden and found a giant earthworm that was 35 cm long. The length of earthworms is normally distributed with a mean length of 14 cm and a standard deviation of 5.3 cm.

Rank 2 Explanation: $z = 3.96$

F. The mean length of a human pregnancy is 268 days with a standard deviation of 16 days. My aunt just had a premature baby delivered after only 245 days.

Rank 6 Explanation: $z = -1.44$

Apr 3-1:08 PM

8.5 Would You Like to Try a Sample?

A Develop Understanding Task

In the task *Whoa! That's Weird!*, you saw a number of statistics for things like the average weight of a house cat. You know it would be impossible to measure all the house cats to find their average weights, but scientists still claim to know it.

You've probably heard it many times before: "Survey results show that 54% of Americans believe that. . ." You're sure that you didn't participate in the survey and neither did anyone you know, and yet, the researchers claim that the survey represents the beliefs of all Americans.

How can this be possible? In the next few tasks, we'll explore how statistics allow us to draw conclusions about an entire group without actually working with the entire group. Sometimes the results make sense and other times you might think that they just can't be right. We will learn how to make judgments about statistical studies, based on the methods that have been used.

First, we need to get our terms straight. When we talk about the entire group that we are interested in, that is called the **population**. When some members of the group are selected to represent the entire group, that is called a **sample**. The thing we are interested in knowing about the population is the **parameter of interest**.

For each of the scenarios below, identify the population, the sample and the population parameter of interest.

1. A grocery store wants to know the average number of items that shoppers purchase in each visit to the store. They decide to count the items in the cart of every twentieth person through the check stand.

   Population Every shopper that comes in the store.

   Sample Every 20th person. EVER.

   Parameter of interest Average # of items shoppers purchase in each visit.

2. A team of biologist wants to know the average weight of fish in a lake. They decide to drop a net and measure all the fish caught in three different locations in the lake.

   Population All fish in the lake.

   Sample Fish caught in nets at 3 locations.

   Parameter of interest Average weight of fish in lake.

Apr 3-1:13 PM

3. There are lots of different ways that a sample can be chosen from a population. Group the following examples of ways to select a sample into six categories.

A. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You decide to put the name of each student in the school into a big bowl. You draw 100 names and ask those students to respond to a survey about the activities they prefer.

B. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You assign each student in the school a number. You randomly select a starting number among the first 10 numbers and then select every tenth student in the list from that point forward.

C. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You use the rolls from each homeroom class. You put the all the names from one class into the bowl and draw two names from the class. You go through each homeroom class, drawing 2 names from each class. You ask those students to respond to a survey about the activities they prefer.

D. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You get the list of all the homeroom classes and randomly select 5 classes. You go to each of the classes selected and survey all the students in that class.

E. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You stand in the cafeteria during your lunch break and ask students in they would be willing to participate in your survey as they walk by.

F. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You use the rolls from each homeroom class. You put the all the names from one class into the bowl and draw two names from the class. You go through each homeroom class, drawing 2 names from each class. You ask those students to respond to a survey about the activities they prefer.

G. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You make a lot of copies of the survey about the activities that students prefer and you put them on a table outside the cafeteria. Students can choose to take the survey and drop their responses into a big box on the table.

Group and we will discuss after SPRING BREAK!

Apr 3-1:14 PM

H. You are interested in finding out the percent of residents in the city that have experienced a robbery in the past year. Using the city property records, you assign each residence a number. You use a random number generator to give you a list of numbers. You contact the residence that corresponds to that number to ask your questions.

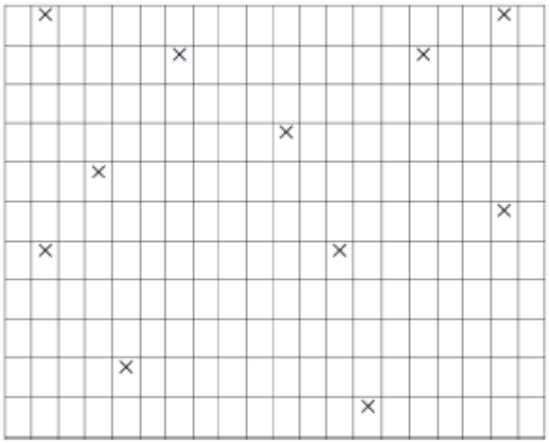
I. You want to know the average number of hours that high school seniors spend playing video games in your state. You randomly select 20 high schools in the state and then ask all the seniors at each of the 20 high schools about their video game habits.

J. An auto analyst is conducting a satisfaction survey, sampling from a list of 10,000 new car buyers. The list includes 2,500 Ford buyers, 2,500 GM buyers, 2,500 Honda buyers, and 2,500 Toyota buyers. The analyst selects a sample of 400 car buyers, by randomly sampling 100 buyers of each brand.

K. A shopping mall management company would like to know the average amount that shoppers in the mall spend during their visit. They post two survey takers near one of the exits who ask shoppers to tell them what they spent as they leave the mall.

L. A restaurant owner wants to find out the average number of dishes ordered at each table served on Friday evenings, their busiest time. She decides to collect and analyze every fifth receipt of the night, starting at 6:00 p.m.

M.



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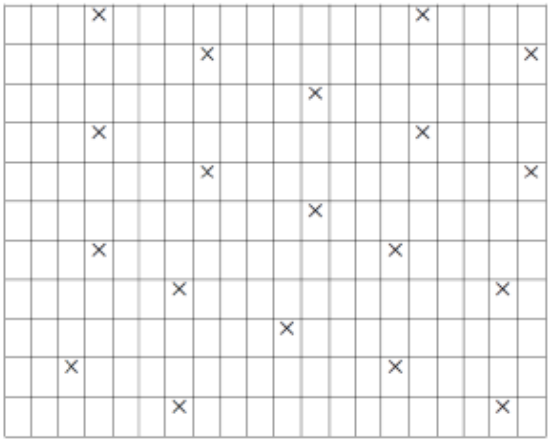

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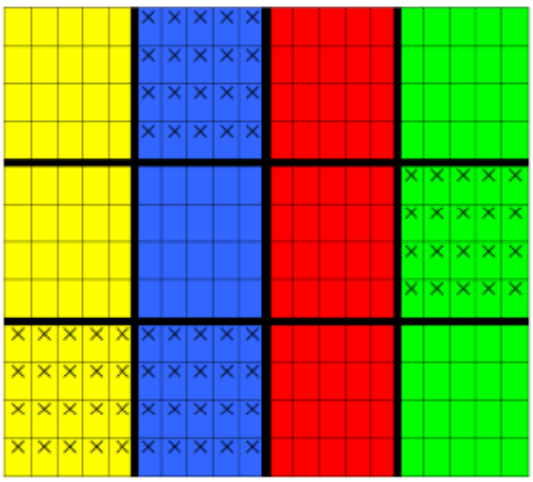

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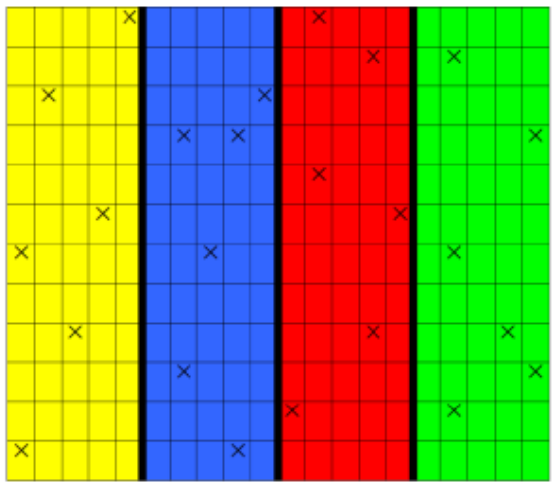

4. What might be some of the advantages and disadvantages of each type?

5. A person you know owns a small theater that shows local dramatic productions. She wants to know the average age of the people that buy tickets to the see the shows so that she can better select which plays to stage. Explain to the owner why selecting the first 20 people that arrive for the show may not be a representative sample.

6. Describe a process for selecting a representative sample of the theater patrons.

Homework

Finish 8.5 "Ready, Set, Go"