Homework- Read section 3.3 Some hints for reading. Read the key concepts closely, look closely at the purple-lined boxes, and then read and try to understand the example chronologically. You can now begin your homework on-line for section 3-3.

Logarithmic function-is the kind of function that _____ the effect of an exponential function

Open your books and look at p. 166 on the top

Exponential (Section 3.2)   now Logarithmic (3.3)
Time vs. population   population vs. time

   $100 = 10^2$ Log 100 = 2

t-chart—to reverse the function you switch the x axis and y axis and then graph. *This is what you are seeing on p. 166*

Key Concept- The common logarithm of a positive number x, written _____
Is the _____ of 10 that gives x.

Formally   _____ if and only if   _____
   1. log 10 = 1 because

   2. log 100 = 2 because

   3. log 1000= 3 because

   4. log 1/10 = -1 because

Example- What is the logarithm of

   A) 1 million
   B) one thousandths
   C) 5?

Now, you try 3.15: What is logarithm of 1 billion?

Real World Examples of Logarithms
I.   ***Key Concept***- The relative intensity of an earthquake is a measurement of
       ground movement. The _____ of an earthquake is the _____
       of relative intensity

Equation

Equation

Look at the chart on p. 169   Richter magnitude

Ex. If an earthquake has a relative intensity of 6700, what is its magnitude?

Meaning-an increase of 1 unit on the Richter scale corresponds to increasing the
relative intensity by a factor of 10
-an increase of t units in magnitude corresponds to increasing relative intensity by a
factor of _____

Ex. P. 170 of book "In 1994 an earthquake measuring 6.7 on the Richter scale
occurred in North ridge California. In 1958….

II> Decibel as a measure of sound
Key Concept- The decibel rating of sound is _____ times the logarithm of its
_____ intensity.

Formulas

II.   Decibels are given in whole numbers

Look at the sound chart in your book on p. 171

Summary
-

-

Example—Look in your book at p. 172 Example 3.18

Summary   vacuumed cleaner   80 decibels
                 Bull dozer   85 decibels

Compare

Example- A stereo plays 60 decibel. What decibel would we expect with a second speaker?

We are doubling the intensity of the sound not the loudness.

Section 3.3 Part 2 Notes Math 115A
Solving exponential equations
Property of Logarithms
1.

2.

3.

Ex. Suppose we have a population that is initially 500 and grows at a rate of 0.5%
per month. How long will it take for the population to reach 800?

Solving Exponential Equations.

Ex. An investment is initially $5000 and grows by 10% each year. How long will it
take for the account balance to reach $20,000? Round answer to one decimal place.

Doubling time and More

Suppose a quantity as an exponential function with a given base. The time t
required to multiply the initial value by K is:

Special case –doubling time where K=2

Ex. An investment grows by 7% each year. How long does it take for the investment to double? Round answer to one decimal place?

Ex. P. 176 in book look at Ex. 3.22
Summary carbon-14 half life is 5770 years

Suppose a charcoal from an ancient campfire is found to contain only one-third of the carbon-14 of a living tree. How long ago did the tree that was the source of the charcoal die? Give answer first in half-lives and then in years rounded to the nearest hundred?

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