

## **Section 11.4 Logarithms**

## **Day 1**

### **Opener**

Practice quiz 16-18

### **Exponentials**

General form  $y = bx$

Input (x): exponent Output (y): value

Application: financial growth, radioactive decay

### **Logarithms**

General form  $y = \log_b x$

Input (x): value Output (y): exponent

Application: measuring decibels, earthquakes, distance in space

**Note:** exponentials and logarithms are inverse functions

### **Graphs:**

**Rewriting Logs to Exponentials and vice versa:** LOOP THE BASE!!

**Examples from 11-4A:** 6, 7

**Your Turn from 11-4A:** 20, 21

**Examples from 11-4A:** 8, 9

**Your Turn from 11-4A:** 26, 27

**Examples from 11-4A:** 10, 11

**Your Turn from 11-4A:** 32, 33

**Assignment:** finish 11-4A

## **Section 11.4 Logarithms**

## **Day 2**

### **Opener**

Practice quiz 18-20

### **Solving Logs:**

**If the log and base are the same on the left and right, you can drop them and solve**

### **Adding/Multiplying in a log**

$$\log_b (mn) = \log_b m + \log_b n$$

### **Subtracting/Dividing in a log**

$$\log_b (m/n) = \log_b m - \log_b n$$

### **Power Property with logs**

$$\log_b (m^p) = p \log_b m$$

**Examples from 11-4B: 13, 15**

**Your Turn from 11-4B: 41, 42**

**Examples from 11-4B: 43, 44**

**Your Turn from 11-4B: 49, 50**

**Examples from 11-4B: 14, 16**

**Your Turn from 11-4B: 52, 51**

**Assignment: finish 11-4B**

## **Section 11.5 Common Logarithms**

## **Day 1**

### **Opener**

Practice quiz 21- 22

### **Common Log**

The log with base 10 is called the common logarithm (This is the log button on the calculator)

Example find  $\log 100$  and  $\log 5.2$

### **Change of Base Formula**

For logs that do not have base 10, you can enter them on the calculator as the ratio of two logarithms:

$$\log_a n = \frac{\log_b n}{\log_b a}$$

b is 10 or e (coming soon)

Memory Hint: the base is low on the log and stays low in the second formula.

Example: #11  $\log_{12} 18$

#12  $\log_8 15$

**Your Turn from 11-5A: 34, 35, 37, 38**

**Examples from 11-5A: 13, 14**

**Your Turn from 11-5A: 40, 41**

**Examples from 11-5A: 52**

**Your Turn from 11-5A: 53**

**Assignment: finish 11-5A**

## **Section 11.5 Natural Logarithms**

## **Day 1**

### **Opener**

Practice quiz 3-7

### **Natural Log**

The opposite of the natural exponential  $y = e^x$  is the natural log  $y = \log_e x$

The natural log can be written as  $y = \ln x$

Both  $e$  and  $\ln$  are on the same button on your calculator.

Graphs:

**Examples from 11-6A: 11, 12**

**Your Turn from 11-6A: 36, 42**

**Examples from 11-6A: 15, 16**

**Your Turn from 11-6A: 48**

**Assignment:** finish 11-6A, odds

DAY 2:

**Assignment:** finish 11-6A, evens