

# PC 12 Session 22

Wednesday, April 6, 2022 1:17 PM

## Pre-Calculus 12 Session 22 Thursday, April 7, 2022

1. Last Day's Homework:
  - Textbook Practice: Section 6.4: pages 320-321, Practise 1b), c), 2b), c), 3a), b), c), 4, 5, 6, 10, 14, 17, the Chapter 6 Review on pages 322 to 323, The Chapter 6 Practice Test on page 324 and the "Chapter 6 Test" that I gave out to you a while back.
  - Readings: Section 8.1 (pages 372 to 379), Section 8.2 (pages 383 to 389), Section 8.3 (pages 392 to 363).
  - Hand-in Assignments and other things: NOTE: The Chapter 6 Hand-in Assignment is due in today! **The Chapter 6 Test** will be on THURSDAY, APRIL 14.
2. A Look at the Chapter 6 Hand-in Assignment
3. More about Section 7.1: Characteristics of Exponential Equations
4. Section 7.2: Transformations of Exponential Functions
5. Section 7.3: Solving Exponential Equations
6. Section 8.1: Understanding Logarithms

**Homework:** This depends on how far we get today.

**Readings:** Section 8.4 (pages 404 to 412), Section 9.1 (pages 430 to 441), Section 9.3 (pages 446 to 451).

### **Practice from the Textbook to try:**

Section 6.4: pages 320-321, Practise 1b), c), 2b), c), 3a), b), c), 4, 5, 6, 10, 14, 17.

The Chapter 6 Review on pages 322 to 323.

The Chapter 6 Practice Test on page 324.

Section 7.1: pages 342-344, Practise 1 to 8 inclusive, 11, and C1.

Section 7.2: pages 354 to 356, Practise 1, 2, 3a), d), e), g), 4, 5, 6c), d), 7a), c), 10, 11, 12.

Section 7.3: pages 364-365, Practise 1, 2, 3a), c), 4, 5a), c), 7a), c), e), g), 9, 10, 11, 12.

Section 8.1: pages 380-381, Practise 1, 2, 3, 4, 6, 8, 9, 11, 12, 13, 14, 19.

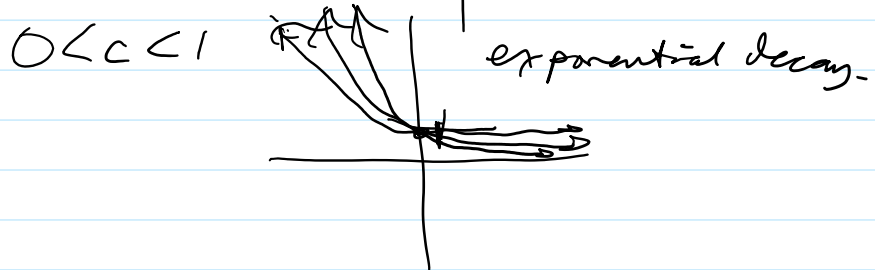
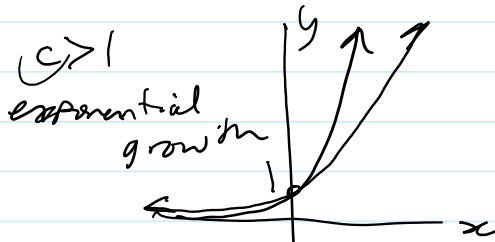
- **Hand-in Assignments:** The Chapter 7 Hand-in Assignment will possibly be due on Thursday, April 14.

**The Chapter 6 Test will be on Thursday, April 14.**

*Last day - started looking at exponential function*

$$y = c^x$$

↑  
base



## Transformations of $y = c^x$

- we can apply the same transformations that we examined in chapter 1 to exponential functions.

$$y = f(x)$$

Vertical expansion/compression

$$y = a f(x) \quad |a| > 1 \text{ VE} \quad 0 < |a| < 1 \text{ VC}$$

$$y = (a)c^x$$

if  $a$  is  $\ominus$  reflection over the  $x$ -axis.

$$y = f(x) \rightarrow y = f\left(\frac{x}{b}\right)$$

horizontal expansion/compression  
- if  $|b| > 1$  there is a horizontal compression by factor  $b$

$$y = c^x \Rightarrow y = c^{2x}$$

↑  
HC by factor  $\frac{1}{2}$

If  $0 < |b| < 1$   $y = c^{\frac{1}{3}x}$

$\frac{1}{\frac{1}{3}} = 3$  HE by factor 3

If  $b$  is  $-$ , there's a reflection over the  $y$ -axis.

$y = f(x)$  if  $x$  is replaced by  $(x-k)$ , there's a horizontal translation of  $k$  units to the right.

$$y = c^x \quad y = c^{x-2} \quad 2 \text{ units right}$$

$$y = c^{x+4} = c^{x-(-4)} \quad 4 \text{ units left}$$

$$y = f(x) \rightarrow y = f(x) + k \quad \text{Vertical translation of } k \text{ units up.}$$

$$y - k = f(x)$$

$$y = c^x \rightarrow y = c^x + 5 \quad 5 \text{ units up}$$

$$y = c^x - 3 \quad 3 \text{ units down.}$$

### Radioactive Decay of Radioisotopes

$$A = A_0 \left(\frac{1}{2}\right)^{t/t_{1/2}} \quad A_0 = \text{initial amount}$$

$t_{1/2} = \text{half-life.}$

Population Growth.

$$P = P_0 (2)^{t/t_D}$$

$P_0 = \text{population at time zero.}$

$t = \text{time since time zero}$

$t_D = \text{"doubling time."}$

$$P = P_0 (3)^{t/t_T}$$

$t_T = \text{"tripling time"}$

$$P = P_0 (4)^{t/t_Q}$$

$t_Q = \text{quadrupling time.}$

### %-age decrease

If something decreases at a rate of  $R\%$ , the

value " $c$ " (i.e. the base of the exponential decay function)

will be  $(1 - \frac{R}{100})$

eg a 30% reduction  $c = (1 - \frac{30}{100}) = 1 - 0.30 = 0.70$ .

%-age growth

If some thing increases at a rate of  $R\%$ , the base of the exponential growth function will be  $(1 + \frac{R}{100})$

eg. 70% growth  $\rightarrow c = 1 + \frac{70}{100} = 1.70$