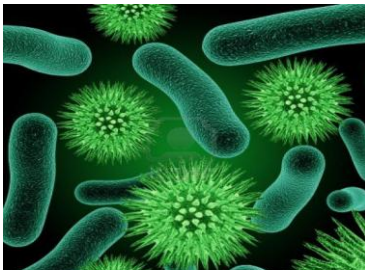
Week 2
Term 1
2013

Learning Brief

SM3
Integrals and Special Functions

Goals



By the end of this week, you should be able to:

- Graph functions of the form $f(x) = a^x$ *and* $f(x) = \log_a x$
- Use your CAS calculator to graph functions
- Identify how the features of these basic graph changes under reflection, translation and dilation
- Understand the relationship between an exponential and a logarithmic function.

Theoretical Components

1. Youtube video on exponential functions: http://www.khanacademy.org/video/exponential-growth-functions?topic=algebra-worked-examples-2
2. Youtube video on logarithmic functions: http://www.khanacademy.org/video/graphing-logarithmic-functions?topic=developmental-math-3
3. Read through the sections from Chapter 5 (5D & 5G) Methods Quest 11 ebook and make notes on the various graphs of exponential and logarithmic functions.
4. Go through the characteristics of exponential functions: http://www.regentsprep.org/Regents/math/algtrig/ATP8b/exponentialFunction.htm
5. Go through the characteristics of exponential functions: http://www.regentsprep.org/Regents/math/algtrig/ATP8b/logFunction.htm

Using the CAS:
http://www.classpad.com.au/
Go to *Basic* Menu, then *Graph and Table* Section

Practical Components

1. Complete the sets of questions in the following links (keep a record of what you have done): http://www.regentsprep.org/Regents/math/algtrig/ATP8b/logexpractice.htm

   http://www.regentsprep.org/Regents/math/algtrig/ATP8b/logpractice.htm

2. Do questions from Ex 5D & Ex 5G from Yr 11 Methods ebook. http://content.jacplus.com.au/faces/pages/ebookviewer.xhtml?isbn=1118310586&chptr=9272&sectionNo=1&pageType=1&view=01&cb=8274600880686 Perhaps try every 2nd or 3rd question i.e
   1a,c,e
   2 a.c.e etc

Investigation

This week there is a **double** investigation. It will count for "2 hours" and there will be no quiz or other forum this week.
See page 2 of this week's brief for the investigation.

QFO

Quiz/Forum/Other

Forum: Don't forget to post a response to last week's topic. The Forum is on the cLc

Other: Please borrow *Cambridge Year 11* textbook from the library.

Quiz: No quiz this week.

Investigation

Task 1

Marta was convinced that there had to be some way to graph $y = \log_2 x$ on her graphing calculator. She typed in $y = \log(2^x)$ and hit **EXE.**

"It WORKED!" Marta yelled in triumph.

"Whaaaaat?" said Celeste. *"I think* $y = \log_2 x$ *and* $y = \log(2^x)$ *are totally different, and I bet we can prove it by converting both of them to exponential form."*
"Yeah, I think you're wrong, Marta," said Sophia. *"I think we can prove* $y = \log_2 x$ *and* $y = \log(2^x)$ *are totally different by looking at the graphs."*

a). Show that $y = \log_2 x$ and $y = \log(2^x)$ are different by sketching the graph of $y = \log_2 x$. Then sketch what your CAS shows to be the graph of $y = \log(2^x)$.
b). Now show that they are different by converting both of them to exponential form.

Task 2

INVESTIGATING LOGARITHMIC GRAPHS 2

Complete the following activity from Jacplus:

http://content.jacplus.com.au/secure/resources/1118310586/Docs/Investigations/doc-9822.pdf?pk=d4293d95711995a1