ALBERTA DISTANCE LEARNING CENTRE
Mathematics 31 Online
MAT3211
Unit 6 Assignment

Student's Questions and Comments

FOR STUDENT USE ONLY

(if label is missing or incorrect)
File Number: _____

Please use the pre-printed label for this course and Assignment

Name
Address
City/Town **Province** **Postal Code**

Apply Assignment Label Here

FOR ADLC USE ONLY

Assigned to _____

Marked by _____

Date received _____

Summary

	Marks Earned	Total Marks	Percent
Unit 6 Assignment		**75**	

Teacher's Comments:

_____
Teacher's Signature

NEW September 2017

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Mathematics 31 Online
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Unit 6 Assignment

4601 - 63 Avenue
Barrhead, Alberta Canada T7N 1P4

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For Users of Alberta Distance Learning Centre Courseware
Much time and effort is involved in preparing learning materials and activities that meet curricular expectations as determined by Alberta Education. We ask that you respect our work by honouring copyright regulations.

Alberta Distance Learning Centre website:

http://www.adlc.ca

The Internet can be a valuable source of information. However, because publishing to the Internet is neither controlled nor censored, some content may be inaccurate or inappropriate. Students are encouraged to evaluate websites for validity and to consult multiple sources.

Mathematics 31 Online

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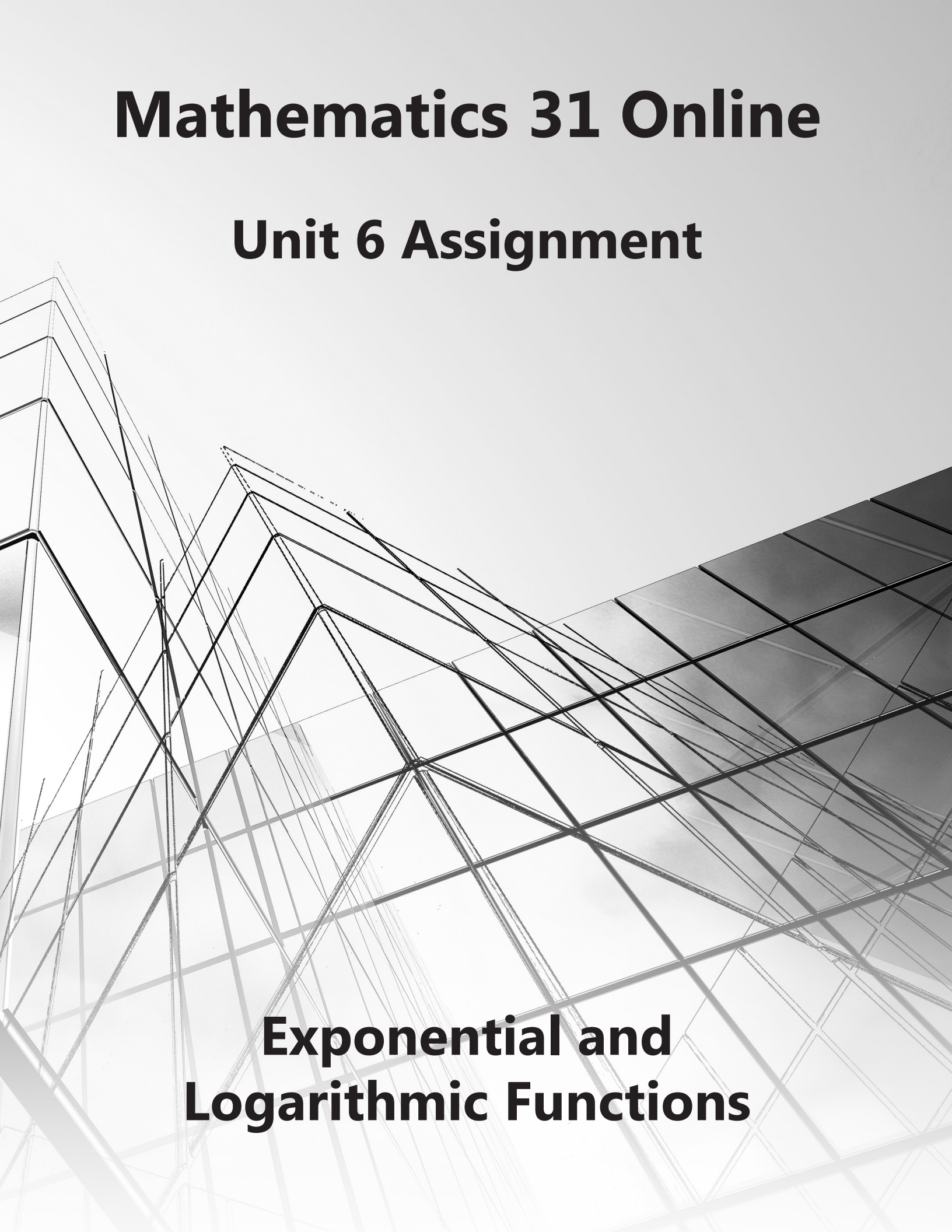

Exponential and Logarithmic Functions

Instructions for Submitting Assignments

1. Submit Assignments **regularly** for assessment.

2. Submit only **one Assignment at a time.** This allows your teacher to provide feedback that you can apply to subsequent course work and exams.

3. Check that your **Assignment is complete.** Your Assignment will be returned as **incomplete** if a reasonable attempt with relevant work has not been made. Therefore, **do not leave any questions blank.** Contact your teacher for help **prior** to submitting this Assignment.

4. Attach the correct address label or complete the Assignment coversheet.

5. Submission Methods:

Postal Mail – Mail the completed Assignment to an Alberta Distance Learning Centre office. Ensure that you attach sufficient postage by having the envelope weighed at the post office.

Electronically – Scan the completed Assignment. Save the file to your computer as **Math 31 Assignment# FirstInitial LastName.** Then, upload the file into your marker's dropbox.

In Person – Drop the completed Assignment at an Alberta Distance Learning Centre campus.

Fax – Fax the completed Assignment to an Alberta Distance Learning Centre campus.

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Our Pledge to You:

Enrolling in this course is another step toward an Alberta High School Diploma. Everyone at Alberta Distance Learning Centre is committed to helping students achieve their educational goals. We welcome your contact in person or by phone, fax, e-mail, voice mail, or postal mail.

Advice:

Your achievement in this course is determined by your success in the assessments of each unit. Your responses to assignments indicate your understanding of outcomes established by Alberta Education.

- Before responding to the assigned questions, read all relevant directions for the Assignment and instruction in the course materials, including the appropriate Guide for Learning and any other resources provided.

- When you encounter difficulties, re-read the directions for the Assignment and review the relevant instruction in the Guide for Learning.

- If you require further clarification, contact your Alberta Distance Learning Centre teacher for assistance.

Notice:

You have one opportunity to submit each Assignment.

- Only under exceptional circumstances will your ADLC teacher re-assess your work. Therefore, apply significant effort to each Assignment.

- If your final exam mark is vastly different from your Quiz marks, your teacher may apply discretion in determining your course mark.

Format

You are encouraged to **handwrite** your written work.

If you type your work, be sure to follow these guidelines:

- Include your full name and student file number as a document header.
- Double-space your final copy.
- Staple your printed work to this Assignment.

ADLC Plagiarism Policy (ADLC Administrative Policy 60–1)

Plagiarism is the practice of representing someone else's work or ideas as one's own. It is an academically dishonest practice and is detrimental to a student's knowledge and skill development. ADLC takes a progressive approach to plagiarism to educate and correct the behaviour.

All incidents will be documented and are subject to the consequences outlined below:

First Incident	Second Incident	Third Incident
The student is given zero scores on any work suspected of being plagiarized and given the opportunity to resubmit original work.	The student is given zero scores on any work suspected of being plagiarized and is not given the opportunity to resubmit original work. A letter is sent by the principal to parents and school facilitators outlining this administrative practice and the consequences.	The student is removed from the course in which plagiarized work is suspected and notifications are put into the ADLC Student Information System, barring future registration to the course in question. A withdrawal letter is sent by the principal to parents and school facilitators.

Important

While removal from a course is limited to the course in which the third incident has occurred, the preceding steps can occur across different courses. A student who has been found plagiarizing in Course A and held to the First Incident consequences who then plagiarizes in Course B will move to the Second Incident consequences.

Any further occurrences after the Third Incident in any other courses will result in immediate removal from that course. Ongoing occurrences may result in removal from all courses and barring of registration with ADLC.

Sharing of ADLC Work (ADLC Administrative Policy 60–4)

Plagiarism is the practice of representing someone else's work or ideas as one's own. It is a dishonest practice and is damaging to a student's knowledge & skill development. Plagiarism is addressed in ADLC Administrative Policy 60-01.

The sharing of school work, especially after having been marked by ADLC, to students for the purposes of submitting plagiarized work (either paraphrasing or directly copying student work) is dishonest, and this sharing goes against the Alberta School Act's expectation of students to respect school rules and co-operate with how schools offer education to their students.

ADLC prefers to take a progressive approach to the sharing of work with other students, in order to educate and correct the behaviour.

If a student is currently enrolled in any ADLC course and found to be sharing school work, whether from their current course or another, to others, the following will happen:

First Incidence	Second Incidence
The student is informed that their work has been submitted as plagiarized work by another student; a warning is provided that further submissions of such work, from any course, will be grounds for removal from the current course(s).	The student is removed from all active ADLC courses.

If the student is not currently enrolled in any ADLC course and found to be sharing school work with others, they are informed that their work has been submitted as plagiarized work by another student and, as such, further registrations in any ADLC course will not be permitted. The incident will be recorded on the student's file.

Such actions do not limit ADLC to pursue other remedies (actions), either criminal or civil, for the distribution of its copyrighted materials.

Unit 6 Assignment

Work slowly and carefully. If you are having difficulty, go back and review the appropriate *Lesson*.

As your final exam does not allow calculators, it is best to attempt all questions in this *Assignment* without a calculator.

Be sure to proofread your assignment carefully.

For full marks, show all calculations, steps, and/or explain your answers.

Total: 75 marks.

1. Find the derivative of the following functions. Simplify as much as possible.

(1) a. $f(x) = e^{5x}$

(1) b. $y = e^{x} + e^{-x}$

(1) c. $y = \sin(e^{x})$

(2) d. $f(x) = e^{\cos 2x}$

(2) e. $y = \sqrt{x}\, e^{x}$

(2) f. $f(x) = \dfrac{e^{4x}}{x^2 + 1}$

(3) 2. Find the derivative of $\frac{x}{y} + e^{y} = e$. State the solution in the form $\frac{a}{b}$, where a and b contain only positive exponents. Simplify as much as possible.

(3) 3. Find the equation of the line tangent to the curve $f(x) = e^{2x}$ at $x = 2$ in general form.

(4) 4. If $f(x) = e^{-x}x^4$, determine the intervals of increase and decrease.

5. Algebraically determine the value of x.

(1) a. $\log_{27} x = -\frac{4}{3}$

(1) b. $\log_{\frac{1}{8}} 16 = x$

(1) c. $\log_x 64 = 6$

(1) d. $2^{\log_3 27} = x$

(2) e. $\dfrac{4^{\log_2 8\sqrt{5}}}{4^{\log_2 \sqrt{5}}} = x$

6. If $\log_3 4 = x$, write the following expressions in terms of x.

(2) a. $\log_3 64$

(2) b. $\log_3 144$

7. Evaluate the following expressions.

(3) a. $\log_{\sqrt{2}} 8 + 2\log_9 3$

(2) b. $\log_2 6 - \log_2 3 + 2\log_2 \sqrt{8}$

8. Write each expression as a single logarithm.

(1) a. $\log_a x - 2\log_a p + 3\log_a r - \frac{3}{4}\log_a z$

(1) b. $-1 + 3\log y + \frac{5}{4}\log x - \log a$

(2) 9. Determine the inverse of $y = 3\ln(x + 5)$. Write the answer in the form $y = f^{-1}(x)$.

10. Solve the following equations.

(1) a. $\ln 5x = 4$

(1) b. $e^{\frac{1}{2}x} = 3$

(1) c. $\ln \sqrt[4]{e} = x$

(1) d. $\ln(3x - 7) = 0$

(1) e. $\ln(\ln x) = 3$

11. Rewrite each expression as a single logarithm.

(1) a. $\frac{\ln a}{2} - \ln b - 3\ln c$

(1) b. $5\ln x + \frac{3}{2}\ln(x^3 + 1) - 4\ln(x^4 - 5)$

12. Find the derivative of each of the following functions. Simply as much as possible.

(1) a. $f(x) = \ln(x - 2)$

(1) b. $y = \ln x^2 + \ln 5$

(3) c. $f(x) = \ln\left(\frac{1+x^2}{1-x^3}\right)$

(1) d. $y = 5^{2x+1}$

(2) e. $y = x \cdot 3^{\sqrt{x}}$

(3) f. $y = 3\ln(x \cdot 5^{2x})$

(2) g. $y = \ln^2(\tan x)$

(2) h. $y = \sin(\ln(2x^5))$

(3) i. $x^y = y^x$

(3) 13. Find the equation of the line tangent to the curve $f(x) = \frac{\ln x}{x}$ at $(1, 0)$ in general form.

14. Use logarithmic differentiation to find $\frac{dy}{dx}$.

(3) a. $y = (4x)^{x+9}$

(3) b. $y = (\ln x)^{x}$

(3) 15. A student wanted to sketch the graph of the function $y = \ln(x^2 - 9)$. She wrote down the following steps:

$$\begin{aligned} y &= \ln(x^2 - 9) \\ &= \ln(x + 3)(x - 3) \\ &= \ln(x + 3) + \ln(x - 3) \end{aligned}$$

She went on to sketch the graph of $y = \ln(x + 3) + \ln(x - 3)$. Her teacher told her that her graph was only half complete. What did she do wrong? Explain.

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