# ALBERTA DISTANCE LEARNING CENTRE
## Mathematics 30-1
### MAT3791
## Workbook 1.4

**Student's Questions and Comments**

**FOR STUDENT USE ONLY**

**Student Name:**

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**FOR ADLC USE ONLY**

**Assigned to**

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**Marked by**

_____

**Date received**

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**Summary**

| | Marks Earned | Total Marks | Percent |
|---|---|---|---|
| Practice 1.4A | **I have ___ /8 and ___%** | | |
| Practice 1.4B | **I have ___ /8 and ___%** | | |
| Explore Your Understanding 1.4 | | | |

**Teacher's Comments:**

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**Teacher's Signature**

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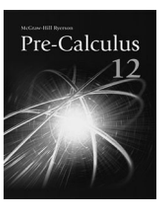


*Pre-Calculus 12*
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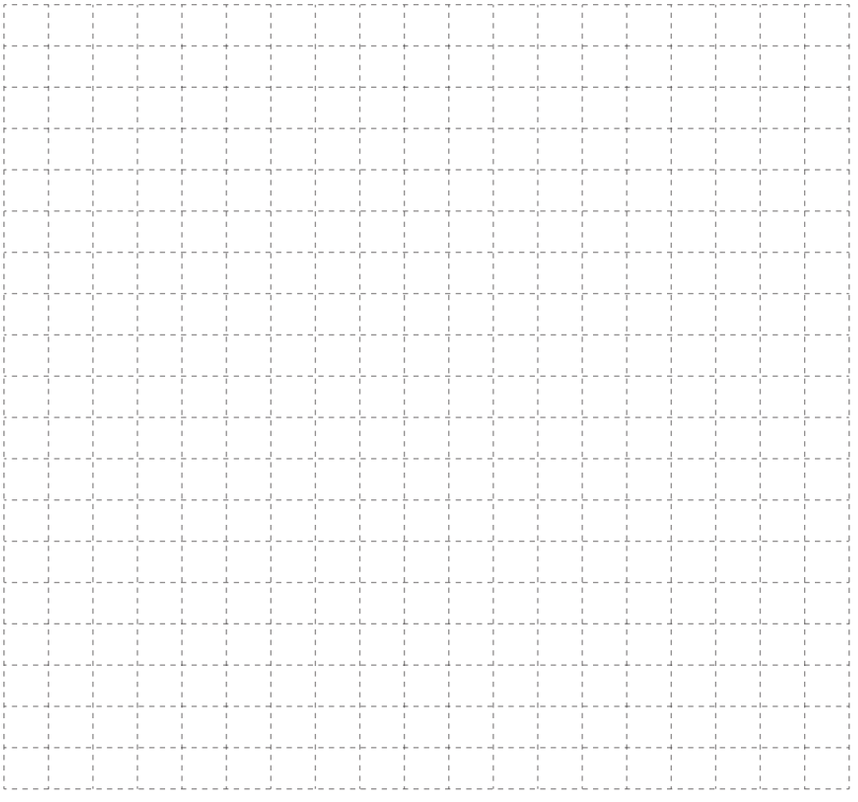
## Explore Your Understanding Assignment 1.4

This assignment is worth 15 marks. You are expected to complete **13 marks** worth of work. If you complete more than this, all completed questions will be used to assign a grade. For example, if you complete all 15 marks worth of work, your assignment total will be 15 instead of 13. You can also complete a question and label it "DO NOT MARK" if your are not confident in your work. Your teacher will then give feedback on your response, which will help clarify any misconceptions, but will not count it towards your required mark total. Please contact your teacher if you have questions.

1. Consider the function $f(x) = 2\left(\frac{1}{3}\right)^x$.

(1) a. Sketch a graph of $y = f(x)$.



(3) b. Complete the following table for the function $f(x) = 2\left(\frac{1}{3}\right)^x$ and its graph.

| | |
|---|---|
| Asymptote(s) | |
| Zero(s) | |
| $x$-intercept(s) | |
| $y$-intercept | |
| Domain | |
| Range | |

2. Dana has predicted the value of her car in the first few years of ownership using a function of the form $y = ab^x$.

| Years After Purchase | Value |
|---|---|
| 0 | \$25 500.00 |
| 1 | \$21 675.00 |
| 2 | \$18 423.75 |
| 3 | \$15 660.19 |

(1) a. Is this an example of exponential growth or exponential decay. Explain.

_____

_____

(2) b. What are the values of $a$ and $b$ in $y = ab^x$?

(1) c. Predict the value of the car $8$ years after purchase.

(2) 3. Solve $81^{x+1} = \frac{27^{3x}}{9^{\frac{21}{2}}}$ using common bases.

(1) 4. A particular colony of bacteria is being grown in a petri dish, and is expected to double every hour and a half. A biologist predicts the colony will eventually cover the petri dish. How many minutes will elapse between the time when the petri dish is half full and when it is completely full?

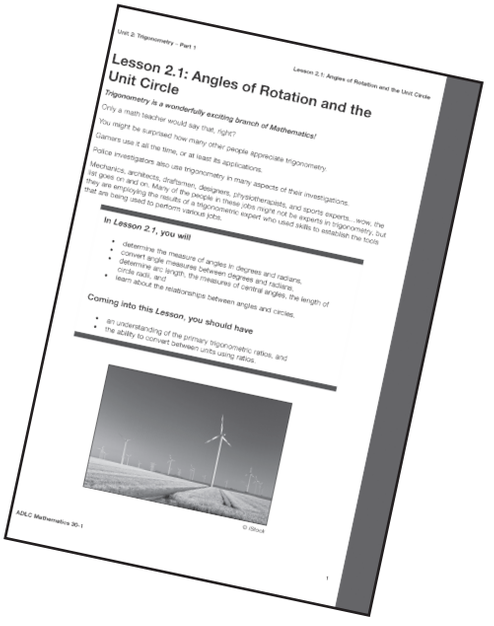
5. Noah has invested $\$2\,000$ in an account that earns an annual interest rate of $3\%$ per year, compounded quarterly.

(1) a. Write the exponential function to represent the amount of money Noah has at time $t$, where $t$ is in years.

(1) b. How much will the investment be worth after $4$ years?

(2) c. Determine the length of time required for Noah's investment to grow to at least $\$2\,900$. (Hint: The value of the investment only increases every quarter. Your answer should reflect this.)

When this workbook is complete, submit it using a method described at the beginning of this *Workbook*. Next, complete *Test Your Understanding Quiz 1.4* online in Moodle. When complete, return to the *Module* and begin *Lesson 2.1*.



Unit 2: Trigonometry – Part 1

Lesson 2.1: Angles of Rotation and the Unit Circle

## Lesson 2.1: Angles of Rotation and the Unit Circle

***Trigonometry is a wonderfully exciting branch of Mathematics!***

Only a math teacher would say that, right?

You might be surprised how many other people appreciate trigonometry.

Gamers use it all the time, or at least its applications.

Police investigators also use trigonometry in many aspects of their investigations.

Mechanics, architects, draftsmen, designers, physiotherapists, and sports experts ... wow, the list goes on and on. Many of the people in these jobs might not be experts in trigonometry, but they are employing the results of a trigonometric expert who used skills to establish the tools that are being used to perform various jobs.

**In *Lesson 2.1*, you will**

- determine the measure of angles in degrees and radians,
- convert angle measures between degrees and radians,
- determine arc length, the measures of central angles, the length of circle radii, and
- learn about the relationships between angles and circles.

**Coming into this *Lesson*, you should have**

- an understanding of the primary trigonometric ratios, and
- the ability to convert between units using ratios.



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**adlc.ca**
1-866-774-5333
info@adlc.ca

Alberta Distance Learning Centre
Box 4000  4601 – 63 Avenue
Barrhead, Alberta  T7N 1P4

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