ALBERTA DISTANCE LEARNING CENTRE
Mathematics 30-1
MAT3791
Workbook 2.3

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 Workbook

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

Apply Workbook Label Here

FOR ADLC USE ONLY

Assigned to _____

Marked by _____

Date received _____

Summary

	Marks Earned	Total Marks	Percent
Practice 2.3A	**I have ___ /8 and ___%**		
Practice 2.3B	**I have ___ /8 and ___%**		
Explore Your Understanding 2.3			

Teacher's Comments:

_____
Teacher's Signature

REVISED MAY 2019

CANADIAN CATALOGUING IN PUBLICATION DATA

MAT3791
Mathematics 30-1
ISBN: 978-1-927090-09-1
Workbook 2.3

4601 - 63 Avenue
Barrhead, Alberta Canada T7N 1P4

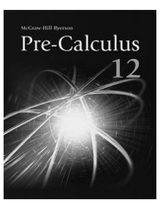
Printed in Canada

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

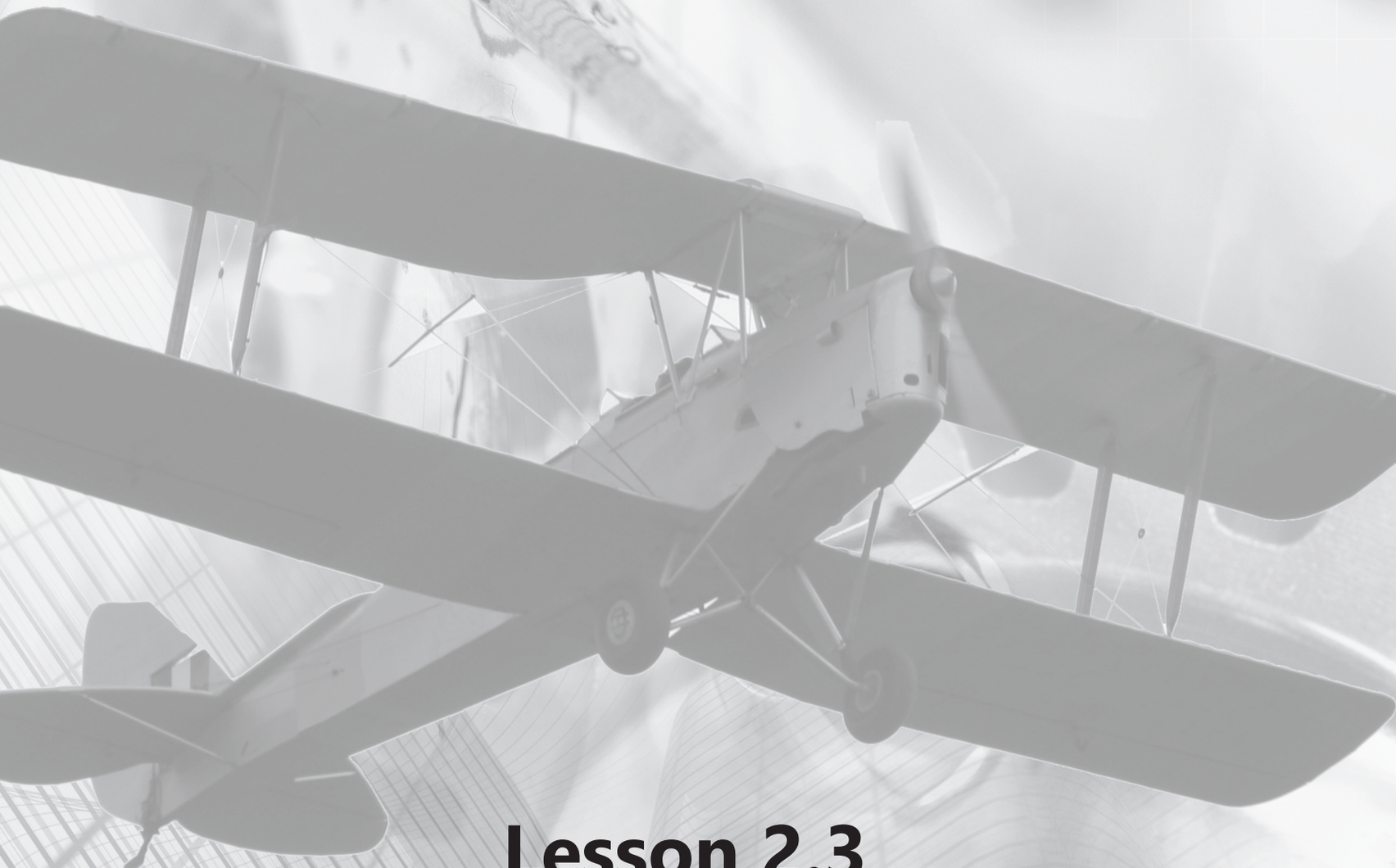
The Internet can be a valuable source of information. However, because publishing to the Internet is neither controlled nor censored, some content may be inaccurate or inappropriate. Students are encouraged to evaluate websites for validity and to consult multiple sources.



Pre-Calculus 12
© McGraw-Hill Ryerson Ltd.

Mathematics 30-1

Workbook 2.3



Lesson 2.3
Sinusoidal Functions and Graphs

Instructions for Submitting Workbooks

1. Submit Workbooks **regularly** for assessment.

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

3. Check that your **Workbook is complete.** Your Workbook 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 Workbook.

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

5. Submission Methods:

Postal Mail – Mail the completed Workbook 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 Workbook. Save the file to your computer as **Math 30-1 Workbook# FirstInitial LastName.** Then, upload the file.

Fax – Fax the completed Workbook to Alberta Distance Learning Centre.

In Person – Drop the completed Workbook at the Alberta Distance Learning Centre office in Barrhead. The address is listed below.

Barrhead
4601 - 63 Avenue
Barrhead, Alberta T7N 1P4
Phone 780-674-5333
Toll-free 1-866-774-5333
Fax 780-674-7593

Mathematics 30-1

Workbook 2.3

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 Workbook 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 Workbook 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 Workbook.

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

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

ADLC Plagiarism Policy (ADLC Administrative Policy 60–1)

Program integrity and academic honesty are very important at ADLC. When students are successful in ADLC courses, we want full confidence that they have clearly met the intended program outcomes.

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 & skill development.

ADLC takes a progressive approach to plagiarism to educate and correct the behaviour. If a student is currently enrolled in any ADLC course and found to have plagiarized work, the following steps are taken:

Warning: ADLC Teachers decide if a warning happens instead of calling the first instance. The warning is recorded in SIS Communications.

First Instance	Second Instance	Third Instance
Students are assigned a mark of zero and a chance to redo the question or the assignment. It is up to the ADLC teacher's discretion whether or not to assign a mark of zero on the plagiarized question or on the entire assignment. ADLC teachers record a SIS Communication and a 'Student Note'.	The student is assigned a mark of zero with no chance to redo the question or the assignment. It is up to the ADLC teacher's discretion whether or not to assign a mark of zero on the plagiarized question or on the entire assignment. The ADLC Principal, or designate, is notified and the instance is recorded in SIS Communications.	Student is removed from the course in which the third instance occurred. The ADLC Principal, or designate, is notified and the instance is recorded in SIS Communications.

Important

While removal from a course is limited to the course in which the Third Instance 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 Instance consequences who then plagiarizes in Course B will move to the Second Instance consequences.

Further Instances

After the Third Instance, any further instances of plagiarism in any course will result in immediate removal from that course. Ongoing occurrences may result in removal from all courses and barring of registration with ADLC.

Clean Slate

Students earn a clean slate after one calendar year passes with no instances.

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 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:

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.

Practice Assessment

Practice provides practice and allows you to self-reflect on your conceptual understanding of the Lesson skills. You will mark your work for *Practice* in each *Workbook* according to the following rubric.

Category	Strategy and Procedures	Response to Questions
	I have…	*I have…*
4	• used efficient and effective strategies to solve the problem(s)	• provided detailed explanations and followed directions appropriately to complete all questions
3	• used effective strategies to solve the problem(s)	• provided clear explanations and followed directions adequately to complete most questions
2	• used effective strategies inconsistently to solve the problem(s)	• provided incomplete explanations and followed some directions to complete a few questions
1	• used ineffective strategies to solve the problem(s)	• provided incomplete explanations and have not followed directions to complete some questions

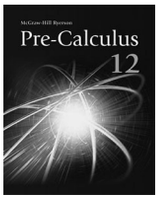
Complete *Practice* exercises using your best work, showing all relevant steps needed to arrive at your solution. Refer to the *Module* to review lesson instructions. Contact your teacher for assistance or clarification as needed, or to investigate the topic further.

Check and correct your work using the solutions provided in *Appendix* in the *Module*.

Practice is worth 8 marks; your mark can help you gauge your understanding of *Lesson* material.

After you have assessed your work, reflect on your understanding of the concepts addressed in the *Practice* exercises in the table provided.

Practice 2.3A



Now, try what you have learned so far. Turn to pages 233 to 236 in *Pre-Calculus 12* and do questions 1a to 1e, 2a to 2e, 3, 18a, and 18b; pages 262 to 263, questions 1a to 1d, 2a to 2f, 3, and 5.

You may check your practice work by turning to the *Appendix* section of the *Module.*

Questions 1a to 1e, page 233

a.

My solution	My corrections if needed

b.

My solution	My corrections if needed

c.

My solution	My corrections if needed

d.

My solution	My corrections if needed

e.

My solution	My corrections if needed

Questions 2a to 2e, page 233

a.

My solution	My corrections if needed

b.

My solution	My corrections if needed

c.

My solution	My corrections if needed

d.

My solution	My corrections if needed

e.

My solution	My corrections if needed

Question 3, page 233

Property	$y = \sin x$	$y = \cos x$
maximum		
minimum		
amplitude		
period		
domain		
range		
y-intercept		
x-intercepts		

Questions 18a and 18b, page 236

a.

My solution	My corrections if needed

b.

My solution	My corrections if needed

Questions 1a to 1d, page 262

a.

My solution	My corrections if needed

b.

My solution	My corrections if needed

c.

My solution	My corrections if needed

d.

My solution	My corrections if needed

Questions 2a to 2f, page 263

a.

My solution	My corrections if needed

b.

My solution	My corrections if needed

c.

My solution	My corrections if needed

d.

My solution	My corrections if needed

e.

My solution	My corrections if needed

f.

My solution	My corrections if needed

Question 3, page 263

My solution	My corrections if needed

Question 5, page 263

My solution	My corrections if needed

Turn to *Practice 2.3A Solutions* in the *Appendix* in *Unit 2 – Part 2*. Use the solutions to check your work and make corrections. Next, use the *Practice Assessment* rubric found on page 1 to give yourself a grade. **Record your grade on the cover of this booklet.** When complete, continue in the *Module*.


Unit 2: Trigonometry – Part 1

Appendix

Practice Solutions

Appendix

Practice 2.3A Solutions

Use these solutions to correct your work. When finished, give yourself a grade using the *Practice Assessment* rubric found in Workbook 2.3.

Pages 233 to 236, questions 1a to 1e, 2a to 2e, 3, 15a, and 15b; pages 262 to 263, questions 1a to 1d, 2a to 2f, 3, and 5.

Questions 1a to 1e, page 233

a. $(0,0),(\frac{\pi}{2},1),(\pi,0),(\frac{3\pi}{2},-1),(2\pi,0)$.

b.

c. The x-intercepts of the graph occur every multiple of π. Within the domain given, they are $-2\pi, -\pi, 0, \pi, 2\pi$.

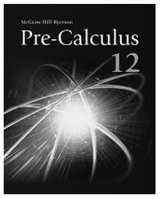
d. The y-intercept occurs at $(0,0)$.

e. The maximum value is 1 and the minimum value is -1.

ADLC Mathematics 30-1

91

Practice 2.3B



Now, try what you have learned so far. Turn to pages 275 to 276 in *Pre-Calculus 12* and do questions 2a, 2b, 6a to 6d, 8a to 8c, and 10.

You may check your practice work by turning to the *Appendix* section of the *Module.*

Questions 2a and 2b, page 275

a.

My solution	My corrections if needed

b.

My solution	My corrections if needed

Questions 6a to 6d, page 276

a.

My solution	My corrections if needed

b.

My solution	My corrections if needed

c.

My solution	My corrections if needed

d.

My solution	My corrections if needed

Questions 8a to 8c, page 276

a.

My solution	My corrections if needed

b.

My solution	My corrections if needed

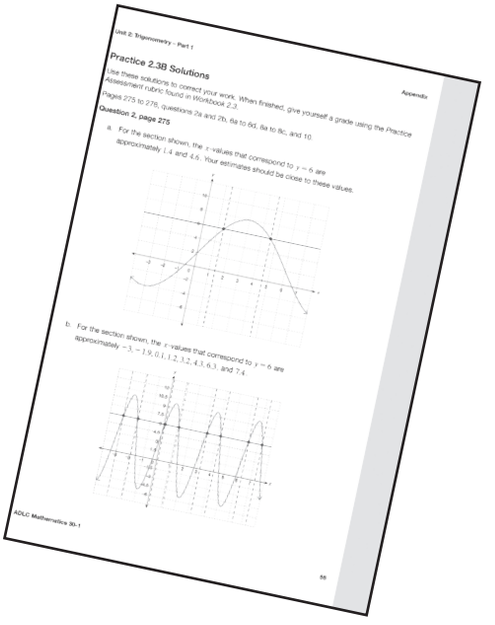
c.

My solution	My corrections if needed

Question 10, page 276

My solution	My corrections if needed

Turn to *Practice 2.3B Solutions* in the *Appendix* in *Unit 2 – Part 2*. Use the solutions to check your work and make corrections. Next, use the *Practice Assessment* rubric found on page 1 to give yourself a grade. **Record your grade on the cover of this booklet.** When complete, continue to *Explore Your Understanding Assignment 2.3.*



Unit 2: Trigonometry - Part 1

Practice 2.3B Solutions

Appendix

Use these solutions to correct your work. When finished, give yourself a grade using the *Practice Assessment* rubric found in WorkBook 2.3.

Pages 275 to 278, questions 2a and 2b, 6a to 6d, 8a to 8c, and 10

Question 2, page 275

a. For the section shown, the x-values that correspond to $y = 6$ are approximately 1.4 and 4.5. Your estimates should be close to these values.

b. For the section shown, the x-values that correspond to $y = 6$ are approximately $-3, -1.9, 0.1, 1.2, 3.2, 4.3, 6.3$, and 7.4.

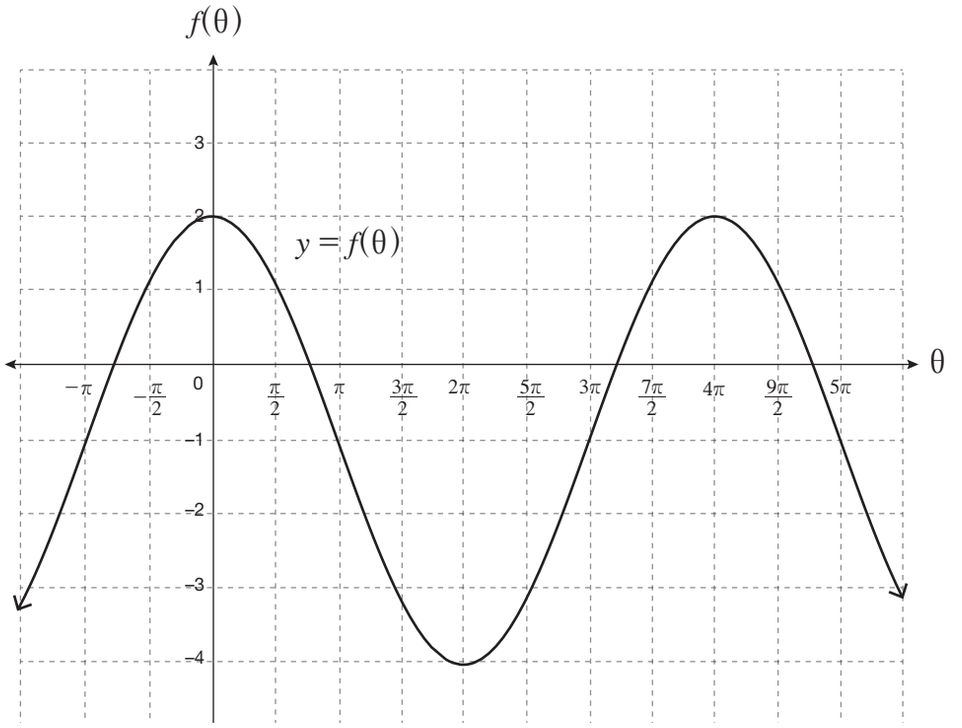
ADLC Mathematics 30-1

55

Explore Your Understanding Assignment 2.3

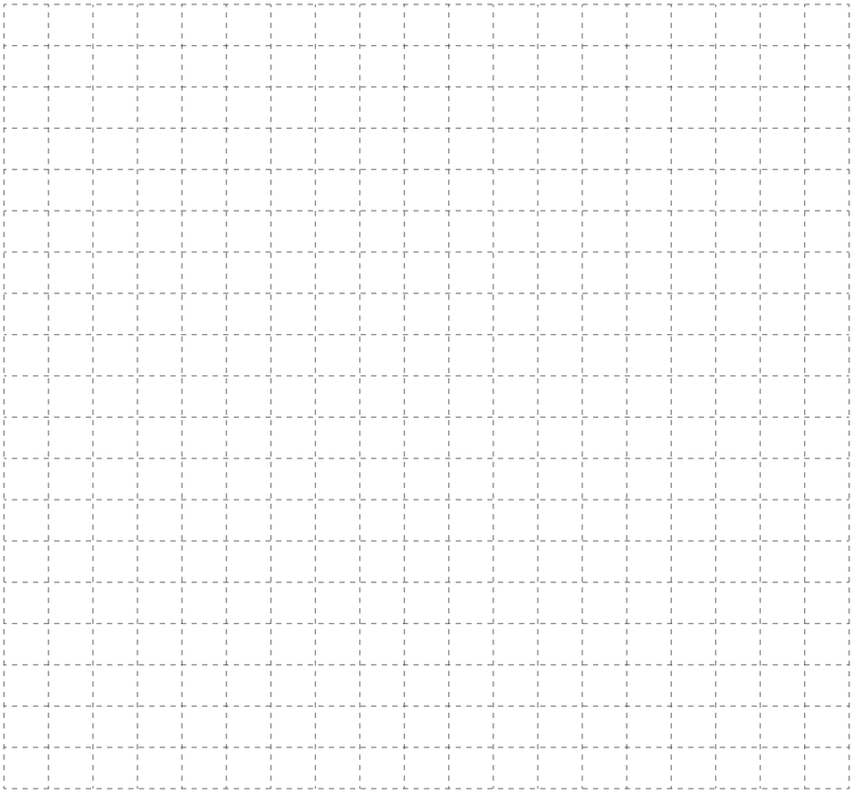
This assignment includes 17 marks. You are expected to complete **14 marks** worth of work. If you complete more than this, all completed questions will be used to assign a grade. For example, if you complete all 17 marks worth of work, your assignment total will be 17 instead of 14. You can also complete a question and label it "DO NOT MARK" if you 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 any questions.

(4) 1. Use the graph provided to complete the table.



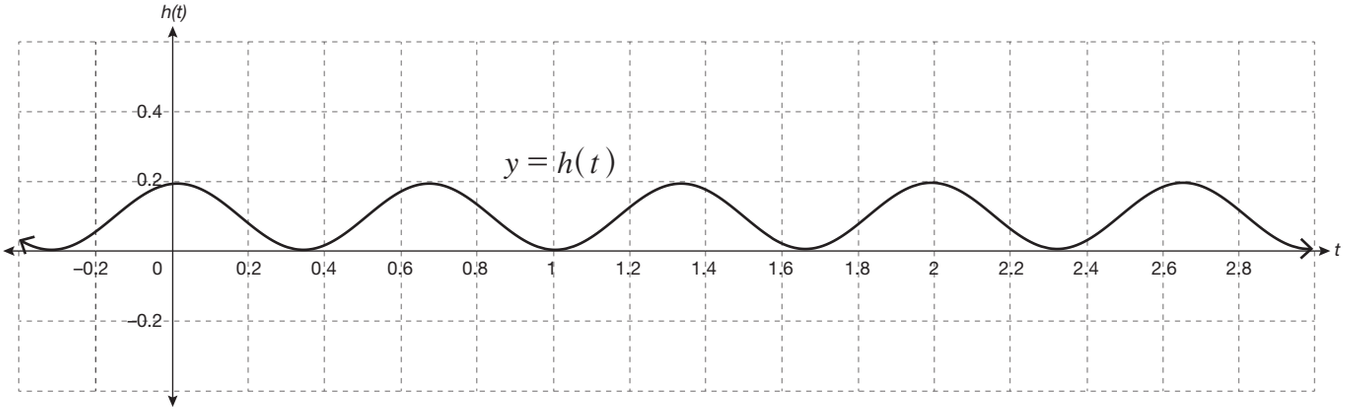
Domain	
Range	
Asymptote(s)	
Approximate zeros (Hint: Make sure to include all zeros in the domain. There are more than four.)	
Maximum	
Minimum	
Amplitude	
Period	

(1) 2. a. Sketch the graph of $y = \tan\theta, -180^\circ < \theta < 540^\circ$.



(1) b. Draw the line $y = \sqrt{3}$ on the graph, and list the points where the two functions intersect.

3. The graph shown represents the height, in centimetres, of a pendulum, at time t seconds, as it swings.

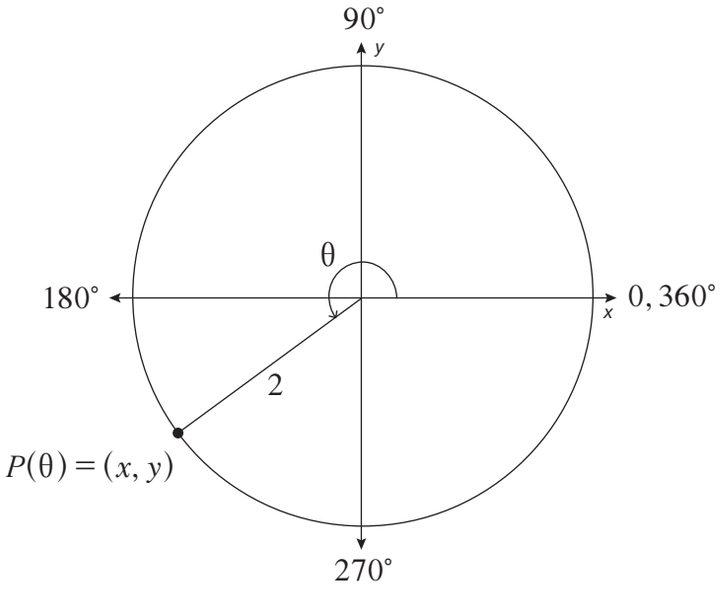


(1) a. Use characteristics of the graph to explain how the pendulum moves.

(1) b. How many times will the pendulum swing each minute?

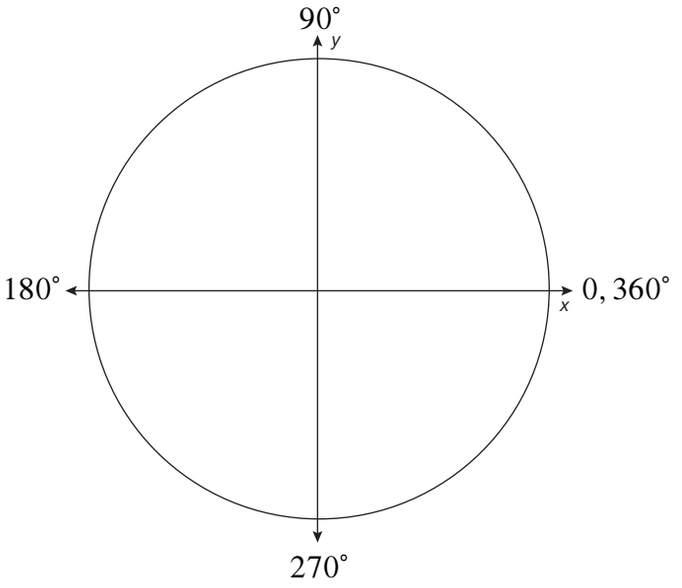
© *iStock*

4. The trigonometric ratio $\sin\theta$ can be defined as the y-value of the intersection of the terminal arm of θ and the unit circle. Suppose a new function, $s(\theta)$, is defined as the y-value of the intersection of the terminal arm of θ and a circle with a radius of 2, as shown in the diagram.



(1) a. Sketch the graph of $y = s(\theta)$. Label the period, amplitude and midline on the graph.

(1) b. Show where 300° and $s(300^\circ)$ occur on on both the circle diagram below and the graph in part a.



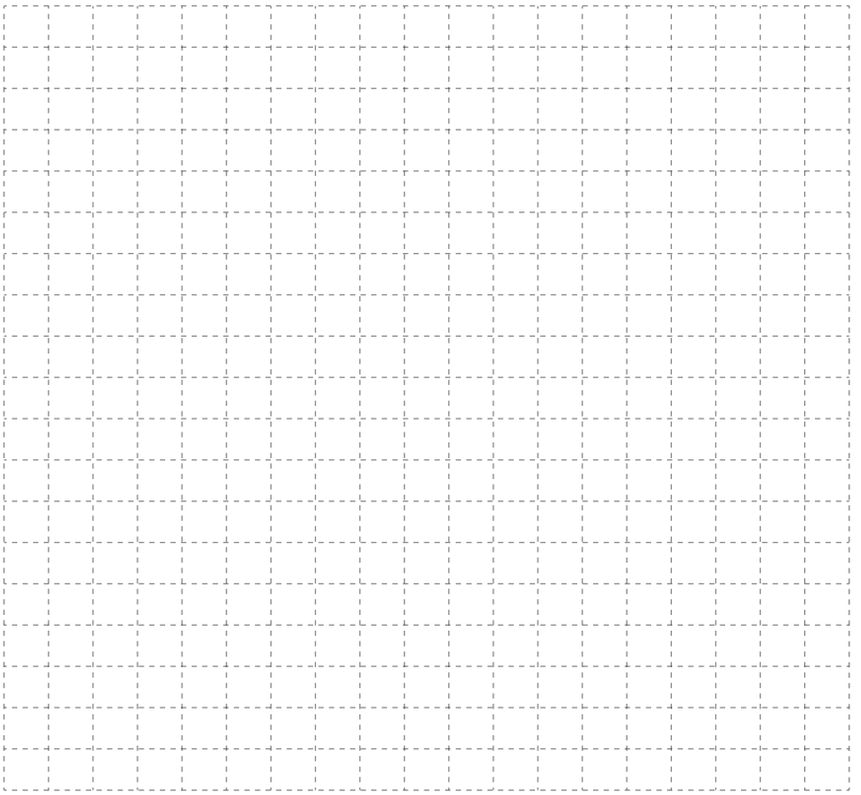
(1) c. Determine the value of $s(300°)$.

(2) 5. a. Algebraically solve $\sec^2\theta - 4 = 0,\ 0 \leq \theta \leq 2\pi$.

(1) b. Verify the solution graphically and explain what the graph represents.

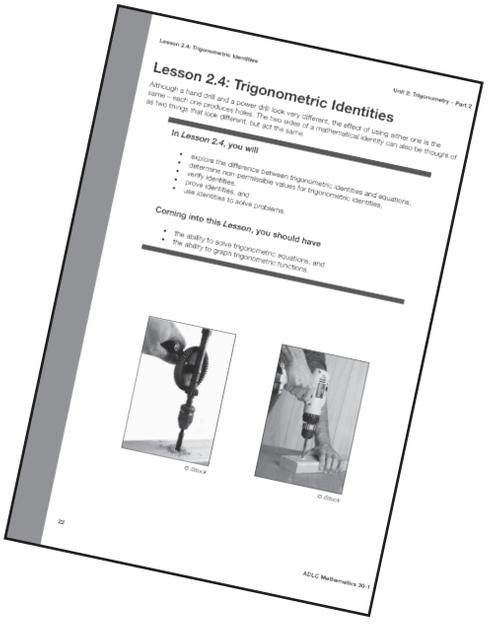
6. Consider the equation $\cos^2\theta + \tan^2\theta = 2$.

(2) a. Graphically determine a general solution to the equation, to the nearest hundredth of a radian.



(1) b. Verify the solution by substitution. Complete at least one verification for each set of coterminal angles.

When this workbook is complete, submit it using a method described at the beginning of this *Workbook*. Next, complete *Test Your Understanding Quiz 2.3* online in Moodle. When complete, return to the *Module* and begin *Lesson 2.4.*


Lesson 2.4: Trigonometric Identities

Unit 2: Trigonometry – Part II

Lesson 2.4: Trigonometric Identities

Although a hand drill and a power drill look very different, the effect of using either one is the same – each one produces holes. The two sides of a mathematical identity can also be thought of as two things that look different, but act the same.

In *Lesson 2.4*, you will

- explore the difference between trigonometric identities and equations,
- determine non-permissible values for trigonometric identities,
- verify identities,
- prove identities, and
- use identities to solve problems.

Coming into this *Lesson*, you should have

- the ability to solve trigonometric equations, and
- the ability to graph trigonometric functions.

© iStock

© iStock

22

ADLC Mathematics 30-1

ADLC | Alberta Distance Learning Centre

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

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

Revised May 2019