ALBERTA DISTANCE LEARNING CENTRE
Mathematics 20-2

MAT2792

Workbook 7

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 Possible Marks	Percent
Project		16	
Course Review			
Student Assessed Course Review		8	

Teacher's Comments:

_____
Teacher's Signature

Revised September 2013

CANADIAN CATALOGUING IN PUBLICATION DATA

MAT2792
Mathematics 20-2
ISBN: 978-1-927090-59-6
Workbook 7

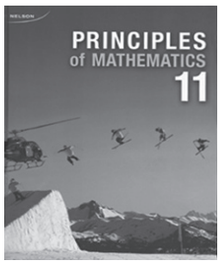
4601 - 63 Avenue
Barrhead, Alberta Canada T7N 1P4

Printed in Canada

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 20-2

Workbook 7
Project and Course Review

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 ***Math20-2 Workbook# FirstInitial LastName***. Then, upload the file into your marker's dropbox.
   - **In Person** – Drop the completed Workbook at an Alberta Distance Learning Centre office.
   - **Fax** – Fax the completed Workbook to an Alberta Distance Learning Centre office.

ADLC Office information is given on the back of the next page.

Mathematics 20-2

Workbook 7

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.

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 Workbook.

Avoid plagiarism by acknowledging all sources you use. Contact your teacher if you are uncertain how to document sources.

Although you are encouraged to work collaboratively and discuss various aspects of this course with others, **all submitted work must be your own**.

Barrhead
4601 - 63 Avenue
Barrhead, Alberta T7N 1P4
Phone 780-674-5333
Toll-free 1-866-774-5333
Fax 780-674-6977

Calgary
341 - 58 Avenue SE
Calgary, Alberta T2H 0P3
Phone 403-290-0977
Toll-free 1-866-774-5333, ext. 6200
Fax 403-290-0978

Edmonton
Suite 300 HSBC Building
10055 - 106 Street
Edmonton, Alberta T5J 2Y2
Phone 780-452-4655
Toll-free 1-866-774-5333, ext. 6100
Fax 780-427-3850

Lethbridge
6 Palliser Education Centre
3305 - 18 Avenue N
Lethbridge, Alberta T1H 5S1
Phone 403-327-2160
Toll-free 1-866-774-5333, ext. 6300
Fax 403-327-2710

Mathematics 20-2 Project

One of the requirements in Math 20-2 is to complete a research project related to mathematics. The project is fairly open-ended and the direction it takes is largely determined by you. Innovation and creativity are valued in projects like this, so you are free to experiment and try something new. Group projects are acceptable, but group members must be identified and approved by your teacher before you begin.

Begin by reading all of the project instructions. Contact your teacher if you are unsure how to proceed after you have read the instructions.

Project Topic

Choose a topic that you are interested in. The project needs to be appropriate for school. Finding information for some topics may be easier than for others. Start by thinking of a general idea you want to work with and then narrow the idea to a specific topic. The following table outlines some possibilities to get you thinking. **You are free to choose something that is not on the list.**

Category	Possible Topic
Weather	Precipitation in Lethbridge
Sports	Goal Scoring by the Edmonton Oilers
Ecology	Ground Squirrel Populations
Populations	World Population Growth
Gaming	Typical Number of Hours of Play Per Week
Technology	Cell Phone Use
Social Media	The Number of 'Friends' People Have
Finance	The Cost of Borrowing Money
Historical	Pythagoras

Project Purpose

Your project needs to have a purpose. **What do you hope to learn that you can then present to others?** It may be useful to think of a question that you will try to answer through your project. Questions related to the previous list of topics are shown. The question may change as you research your topic.

Topic	Possible Question
Precipitation in Lethbridge	Is the amount of precipitation in Lethbridge typical for Alberta?
Goal Scoring by the Edmonton Oilers	How has goal scoring by the Edmonton Oilers changed over the past decade?
Ground Squirrel Populations	How are ground squirrel populations modelled?
World Population Growth	Will the world population ever peak?
Typical Number of Hours of Play Per Week	Which type of video game is played the most?
Cell Phone Use	Which phone plan is the most cost effective?
The Number of 'Friends' People Have	Do I have more 'friends' than most people?
The Cost of Borrowing Money	Is it more expensive to borrow money from a payday loan company than a bank?
Pythagoras	Did Pythagoras discover the theorem named after him?

Research

Once you have decided on a topic and purpose, you will need to conduct some research. There are two types of research and your project can include either or both.

© *Thinkstock*

Primary Research

Primary research involves **you collecting data** from the world around you. You might use surveys, experiments, or observations. If you use primary research, make sure to describe how your data was collected as part of your presentation.

Examples:

- In order to determine a typical height range for someone in grade 11, Emma measured the height of each of her classmates.
- Gamil was interested in where different birds live. He recorded the type and number of all the birds he saw over a set time period at several different locations.

- Brittney was interested in how much people read for leisure. She had people complete a survey to help answer this question.

Secondary Research

© *Thinkstock*

Secondary research means **using someone else's data**. Secondary sources of information include books, the internet, videos, or newspapers. If you use secondary research, make sure to reference your sources properly. See the references section.

Examples:

- To determine the best season the Seattle Seahawks ever had, Brennan used statistics he found at *nfl.com*.
- In order to provide background information for her project, Perle needed to find out how an electric guitar works. From the library, she checked out one book on electric guitar history and another one on building electric guitars.
- Jacob watched a fascinating documentary on electric cars. He decided to use some of the information from the documentary for his project on comparing the fuel efficiencies of different vehicles.

It is more important to stay organized when conducting any type of research. Using lists and tables may help you to organize and keep track of the data as it comes in. Remember to write down all sources of information when using secondary research so you don't have to try to find the sources again later.

Analysis

Once you have researched your topic, you will need to interpret the data. Your task is to **analyze the information to answer your original question**. This will look different for every project and **may** include the following:

- Calculating statistics such as the mean and standard deviation of a set of data
- Graphing a set of data
- Comparing data values
- Looking for patterns or trends
- Determining whether data from different sources are consistent

Part of your analysis should be an analysis of the data source(s). Ask yourself the following:

- Do the data appear to be biased? Is the source promoting a particular point of view?
- Does the source appear to be reputable?
- Is there enough data to draw conclusions?

Biased information promotes one point of view while ignoring others. Most forms of advertising present biased information by indicating good qualities of a product while ignoring the negative.

Even if your data was obtained through primary research, you must still consider whether YOUR data and the manner in which YOU collected the data were at all biased and whether YOU obtained sufficient data to draw conclusions.

If there appears to be a problem with your primary or secondary data, either don't use the data or explain the problem so your audience can also interpret the data correctly.

Conclusions

Once you have analyzed your data, you should be able to draw conclusions related to your project's original question (purpose). Here you want to **state the key findings of your analysis** and describe the implications of these findings.

Example: Carlos' original question was "What will be the land speed record in 2030?". His key findings included the pattern of land speed records to date, factors that might limit a land speed record, and his prediction of the record for 2030. He then explained that his prediction was really a goal for the future and that technology would need to improve for his prediction to be correct.

Presentation

Your project's presentation is **how you will display/present your project** so others will understand it. The presentation format is your choice, but you need to be able to send it to your marker. Some suggested formats are a

- Written report
- Video
- Multimedia presentation (such as a PowerPoint or Prezi)
- Poster

© Thinkstock

For many project presentations, it is a good idea to begin by giving background information on the topic and describing the question you are trying to answer. You can conclude your presentation by describing key findings and explaining why they are important or how they might be used.

References

It is important to **give credit to other people's work** used in your project. This credit should be given in two places.

In-Text Referencing

When you use a quote, picture, table or anything else that is not yours, make a note of it right beside the borrowed information. The exact format is not important for this project, but do try to be consistent throughout.

Reference List

This is a detailed list of the sources you used in your project. The reference list usually comes at the very end of a report or presentation. Microsoft Word has a References tool that may help you to format your references list.

Example

Billy Beane and Paul DePodesta took a radical approach to baseball management that allowed their financially-strapped team to be competitive with more well-funded teams (Lewis, 2004).

Papushin, 2005 *wikimedia.org*

RK	Player	Team	AVG	OBP	SLG	OPS
1	Giambi, J	OAK	0.342	0.477	0.66	1.137
2	Dye, J	OAK	0.297	0.366	0.547	0.913
3	Chavez, E	OAK	0.288	0.338	0.54	0.878
4	Giambi, J	OAK	0.283	0.391	0.45	0.841
5	Byrnes, E	OAK	0.237	0.326	0.5	0.826
6	McMillon, B	OAK	0.293	0.354	0.448	0.802

(MLBAM, 2013)

References

Lewis, M. (2004). *Moneyball: The Art of Winning an Unfair Game*. New York: W. W. Norton & Company.

MLBAM. (2013, 04 12). *MLB.com*. Retrieved 04 16, 2013, from Statistics: http://mlb.mlb.com/stats/sortable.jsp?c_id=mlb&tcid=mm_mlb_stats#elem=[object+Object]&tab_level=child&click_text=Sortable+Player+hitting&game_type=%27R%27&season=2001&season_type=ANY&league_code=%27MLB%27&sectionType=sp&statType=hitting&page=1&ts=13661407

Papushin, K. (2005). Wrigley Field April 2005.

Notice in the example that even though there isn't a direct quote and the table has been modified from the original version, credit was still given to the original sources. If you are unsure, give credit.

Planning Guide

Use this guide to help you plan your project. Some sample guides are shown after this template.

Topic	
Purpose of project	
Anticipated research	
Anticipated analysis	
Presentation	

Once you have completed this guide, before proceeding with your plan, contact your teacher to discuss your project plan.

Sample Planning Guides

Sample 1

Topic	Dolphin populations
Purpose of project	Are spotted dolphin populations high enough to sustain hunting?
Anticipated research	• Where do spotted dolphins live? • How large are the populations? • How have populations changed over time? • What areas are hunted? • What does a typical hunt encompass? • How have hunting practices changed over time?
Anticipated analysis	I plan to graph the spotted dolphin population data and the hunting data. I will look for patterns between the graphs that show how the two are related. If an increase in hunting seems to correlate with a lower dolphin population, I may conclude that an observed population change is due to hunting. I will also extrapolate the data to see what could be expected to happen to the spotted dolphin population in the future with and without hunting.
Presentation	PowerPoint presentation

A **correlation** shows a relationship between two things. For example, warm weather and sunshine are correlated.

An **extrapolation** uses existing data to make a prediction outside the range of the data.

An **interpolation** uses existing data to make a prediction within the range of the data.

Sample 2

Topic	Early ocean navigation
Purpose of project	I've heard that clocks used to be important to navigation. I want to find out how timekeeping was used by sailors to determine their location on the ocean.
Anticipated research	I plan to research historical ocean navigation. I may also need to look at a timeline of clocks to see what kinds were available to early sailors.
Anticipated analysis	I plan to give an overview of what I learn in my research. I will then give an explanation and some examples of how sailors navigated and hopefully I will be able to describe how clocks were used to help him.
Presentation	I plan to write a report that includes pictures and diagrams to support the explanations.

Sample 3

Topic	Basketball shots
Purpose of project	Is a quadratic function actually a good model for a basketball shot?
Anticipated research	I'm going to make a video in which I will shoot a basketball from many different locations on a basketball court.
Anticipated analysis	I'm going to take several still frames from a single shot. Next, I will overlay a Cartesian coordinate plane on each still frame to give a set of coordinates to each ball location. I will then try to sketch and determine the equation of a quadratic function that passes through all of the points. I will repeat this process for a few different shots to see if my results are consistent.
Presentation	PowerPoint that includes my videos and pictures.

Sample 4

Topic	Social Media
Purpose of project	Do boys and girls use social media differently?
Anticipated research	A survey with questions like the following: • Do you use social media? • What types of social media do you use? ◦ Facebook ◦ Twitter ◦ blogs ◦ internet forums ◦ gaming ◦ other • For how many hours per week do you use social media? • For how long have you been using social media? I plan to get at least 20 boys and 20 girls at my school to take the survey.
Anticipated analysis	I plan to calculate percentages for the first two questions' data and I will calculate the mean, median, range, and standard deviation for the third and fourth questions' data. I will compare all of the values of the two groups and look to see if boys and girls use social media differently.
Presentation	I'm going to make a video. In the video, I'm going to first describe social media and then I'm going to show the survey and some people completing it. After that, I'll give a summary of my data and calculations. Finally, I'll describe what I discovered from my analysis of the survey results.

Project Checklist

Use this checklist once you have completed your project. You should be able to answer **yes** to each statement when your project is complete.

Project Checklist	Yes	No
The topic is appropriate.		
My project uses math or is related to math.		
There is background information for someone that is not familiar with my topic.		
Diagrams and tables are clear and easy to read.		
The data or a summary of the data collected has been included.		
The data has been analyzed thoroughly.		
A convincing argument that answers the original question has been made.		
Where possible multiple points of view have been described.		
Information taken from another source has been properly referenced.		
Accuracy and reliability of the data has been checked and any concerns have been noted.		

"How long should my project be?"

There is no minimum or maximum length for your project, but asking yourself the following questions may help decide when you are finished.

- Have I considered all of the sections outlined in this guide?
- Have I described my topic thoroughly?
- Have I analyzed my data thoroughly?
- Does the project feel complete?
- Am I proud to present this to someone else?

Rubric

Complete your *Course Research Project* using your best work. Your project will be assessed according to the rubric and criteria provided.

Category	4	3	2	1
	The student…	*The student…*	*The student…*	*The student…*
Collect primary or secondary data related to the topic	Collected data that is **pertinent** and **conclusively** established the trend.	Collected data that is **relevant** and **substantially** established the trend.	Collected data that is **suitable** and **generally** established the trend.	Collected data that is **irrelevant** and **does little to** establish the trend.
Interpret the Data	Provided an **astute** interpretation of the data.	Provided a **credible** interpretation of the data.	Provided a **rudimentary** interpretation of the data.	Provided a **flawed** interpretation of the data.
Present multiple sides of the issue with supporting data	Presented multiple sides of issue with **precise** supporting data.	Presented multiple sides of issue with **relevant** supporting data.	Presented multiple sides of issue with **basic** supporting data.	**Unable** to present multiple sides, or presented multiple side of issue with **flawed** supporting data.
Organize and present the research project	Organized and presented the research in a **purposeful** and **compelling** manner.	Organized and presented the research in a **logical** and **effective** manner.	Organized and presented the research in a **reasonable** and **simplistic** manner.	Organized and presented the research in a **disorganized** and **ineffective** manner.
				Total: _____ / 16

Criteria	Description of Criteria	Yes	Not Yet
Assess the accuracy, reliability, and relevance of the sources of the data collected	The student has critically analyzed the sources of data and discussed their accuracy and reliability.		
Teacher Comments:			

Presenting multiple sides of an issue will mean different things for different projects. For the four sample projects, multiple sides may be presented in the following ways:

- Dolphin populations – Both a hunter's perspective as well as an environmentalist's perspective could be considered in the project.
- Oceanic navigation – The history of oceanic travel was not the same for all cultures, so the significance of clocks could be described for various cultures.
- Basketball shots – Reasons that a quadratic function is a good model as well as reasons that a quadratic function is a bad model could both be shown.
- Social media – Both similarities and differences in how boys and girls use social media could be discussed.

Mathematics 20-2 Course Review

You have now learned all of the concepts for Math 20-2. This course review includes a summary table of topics and review problems for each *Unit*. Many of the problems include a solution and your task is to show how the solution was found. You will self-assess your work in the review using the following rubric, like you did for each *Coach's Corner*.

Category	Strategy and Procedures	Response to Questions
	The student...	*The student...*
4	• uses efficient and effective strategies to solve the problem(s)	• provides detailed explanations and follows directions appropriately to complete all questions
3	• uses effective strategies to solve the problem(s)	• provides clear explanations and follows directions adequately to complete most questions
2	• uses effective strategies inconsistently to solve the problem(s)	• provides incomplete explanations and follows some directions to complete a few questions
1	• does not use effective strategies to solve the problem(s)	• provides incomplete explanations and does not follow directions to complete some questions

When you submit this course review, your marker will choose one question from each Unit to mark.

Unit 1: Radicals

Concept	I know how to do that	I'm going to review that topic
Estimate, compare, and order radicals.		
Express an entire radical as a mixed radical.		
Express a mixed radical as an entire radical.		
Perform operations on radicals – add, subtract, multiply, and divide.		
Rationalize the denominator of a radical expression.		
Determine variable restrictions for radical expressions and equations.		
Determine the roots of a radical equation (the solution).		
Verify the roots (solution) of a radical equation.		
Determine the extraneous roots by verification.		

Unit 1: Radicals Review Questions

(4) 1. Convert each mixed radical to an entire radical and each entire radical to the simplest mixed radical.

a. $12\sqrt{7}$

Answer is $\sqrt{1008}$

b. $\sqrt[3]{-192}$

Answer is $-4\sqrt[3]{3}$

c. $-6\sqrt[3]{13}$

Answer is $\sqrt[3]{-2808}$

d. $\sqrt{72}$

Answer is $6\sqrt{2}$

(3) 2. Simplify each of the following expressions.

a. $3\sqrt{5}-7\sqrt{2}+3\sqrt{2}+4\sqrt{5}$

Answer is $7\sqrt{5}-4\sqrt{2}$

b. $2\sqrt{3}(8\sqrt{2}+4\sqrt{7})$

Answer is $16\sqrt{6}+8\sqrt{21}$

c. $\dfrac{9\sqrt{72}}{2\sqrt{24}}$

Answer is $\dfrac{9\sqrt{3}}{2}$

(4) 3. State the restrictions on the variables and then simplify each of the following expressions.

a. $x\sqrt{12x^4}$

Answer is $2x^3\sqrt{3}$

b. $(3x\sqrt{x^2})(2\sqrt{x^5})$

Answer is $6x^4\sqrt{x}$

(3) 4. Consider the equation $-7 = 2 - \sqrt{12x - 3}$.

a. State the restrictions on x.

Answer is $x \geq \frac{1}{4}$

b. Solve the equation.

Answer is $x = 7$

c. Is the solution extraneous? Explain.

Answer is No

Unit 2: Quadratic Functions

Concepts	I know how to do that	I'm going to review that topic
Determine the coordinates of the vertex of the graph of a quadratic function, with and without technology.		
Determine the equation of the axis of symmetry, given the x-intercepts of the graph of a quadratic function.		
Determine the y-coordinate of the vertex of the graph of a quadratic function given its equation and the equation of the axis of symmetry and state whether or not it is a maximum or minimum value.		
Determine the domain and range of a quadratic function.		
Sketch the graph of a quadratic function.		
Solve a contextual problem involving some or all of the characteristics of a quadratic function.		
Determine the intercepts of the graph of a quadratic function, with and without technology.		
Determine the roots of a quadratic equation and verify by substitution.		
Determine the roots of a quadratic equation by factoring, using the quadratic formula and using technology.		
State the relationships between the roots of an equation, the zeros of the related function, and the x-intercepts of the graph of that function.		
Determine the nature of the roots of a quadratic function (how many, real or non-real).		
Express a quadratic function in factored form given the x-intercepts of its graph or the zeros of the function.		
Solve a contextual problem by modelling a situation with a quadratic function.		

Unit 2: Quadratic Functions Review Questions

(4)

1. Determine the x-intercepts, y-intercept, equation of the axis of symmetry, and vertex for each of the following functions.

   a. $f(x) = 3(x-2)^2 - 6$ with zeros of 0.59 and 3.41

x-intercepts	
y-intercept	
equation of the axis of symmetry	
vertex	

   b. $g(x) = (x-4)(x+7)$

x-intercepts	
y-intercept	
equation of the axis of symmetry	
vertex	

(3)

2. Determine the standard form of a quadratic function whose graph has a y-intercept of 8 and a vertex at (–2,–4).

Answer is $f(x) = 3x^2 + 12x + 8$

(4)

3. Solve each of the following equations using the method identified. Verify all solutions.

   a. $x^2 + x = 6$, by factoring

Answer is $x = -3, 2$

b. $2x^2 - 5 = 3x$, using the quadratic formula

Answer is $x = -1, 2.5$

(3) 4. The distance a car will skid after its brakes lock can be modelled by the equation $d = kv^2$, where d is the stopping distance, in metres, k is a constant based on road conditions, and v is the velocity of the car, in metres per second, at the moment the brakes lock.

a. If $k = 0.04$, how far will a car skid if it was travelling at 32 m/s?

Answer is 41 m

b. If a car skids 79 m when $k = 0.031$, how fast was the car travelling?

Answer is 50 m/s

(3) 5. The length of a rectangle is 4 units more than the width. If the rectangle has an area of 77 square units, what are the length and width of the rectangle?

Answer is $w = 7$, $l = 11$

Unit 3: Logic and Reasoning

Concepts	I know how to do that	I'm going to review that topic
Make a conjecture based on patterns		
Provide and explain counterexamples		
Compare inductive and deductive reasoning		
Prove a conjecture		
Determine if an argument is valid		
Identify errors in a proof		
Solve problems using deductive reasoning		

Unit 3: Logic and Reasoning Review Questions

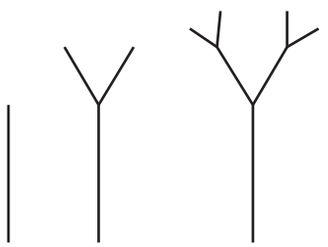
(4)

1. Conjecture the next two elements for each pattern. Describe the pattern.

   a. 5, 8, 14, 26, 50

   Answer is 98, 194

   b.



(2) 2. Ashley claims that the sum of four multiples of 6 will be a multiple of 12. Is Ashley's conjecture reasonable? If not provide a counterexample.

Answer is No

(3) 3. Prove that the perimeter will be even for any rectangle with natural number side lengths.

(4) 4. Two girls, Bella and Destiny, and two boys, Ryan and José, each have a different favourite colour: red, green, blue, and black. Use the following clues to determine each person's favourite colour.

- One person's name and favourite colour start with the same letter.
- Bella doesn't like black.
- One of the boys likes blue.

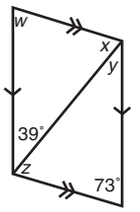
Unit 4: Geometry

Concepts	I know how to do that	I'm going to review that topic
Prove properties of angles formed by transversals and parallel lines.		
Determine if two lines are parallel.		
Draw parallel lines using a compass or protractor.		
Determine unknown angles using parallel lines, angles, and triangles.		
Determine and use a rule for determining the interior angle sum of a polygon.		
Identify and correct errors in a geometric proof.		
Prove that two triangles are congruent.		
Solve problems using angles and triangles.		
Determine if a solution to a geometric problem is reasonable and correct it if necessary.		
Explain a proof of the sine law.		
Explain a proof of the cosine law.		
Draw a diagram to represent a word problem that uses triangles.		
Solve problems using the sine law.		
Solve problems using the cosine law.		
Solve problems that involve more than one triangle.		

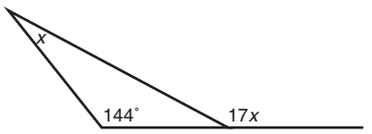
Unit 4: Geometry Review Questions

4

1. Determine the unknown values identified in the following diagrams. Explain how you determined each unknown.

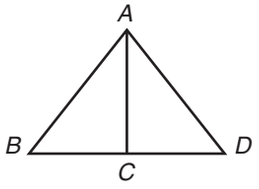
a. 

Answer is $w = 73°$, $x = 68°$, $y = 39°$, $z = 68°$

b. 

Answer is $x = 9°$, $17x = 153°$

(4) 2. Given $AC \perp BD$ and C is the midpoint of BD, prove that $\angle B = \angle D$.



Statement	Justification

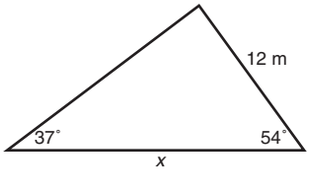
(3) 3. The interior angles of a polygon each measure 150°. How many sides does the polygon have?

Answer is 12

(3) 4. Luna is building a two piece roof for her shed. The width of the shed is 8 ft, one roof piece is 4 ft long and the other is 6 ft long. What angle is formed at the peak of the roof?

Answer is 104°

(3) 5. Determine the length of x.



Answer is 20 m

Unit 5: Proportional Reasoning

Concepts	I know how to do that	I'm going to review that topic
Interpret and compare rates and unit rates.		
Convert rates to different units.		
Use graphs to interpret and represent rates.		
Explain the solutions to problems involving rates.		
Draw scale diagrams of 2-D shapes.		
Determine the scale factors for 2-D shapes and 3-D objects.		
Determine unknown dimensions given the scale factor of 2-D shapes and 3-D objects.		
Solve problems involving factors and scale diagrams.		
Determine the area of 2-D shapes given a scale diagram.		
Determine the surface area of 3-D objects given a scale diagram.		
Explain how scale factor, area, surface area, and volume are related.		
Solve problems involving scale factor, area, surface area, and volume.		

Unit 5: Proportional Reasoning Review Questions

(4)

1. Wit is planning on replacing the floor tiles in his kitchen. Wit has found four types of tiles he likes, and wants to compare their prices.

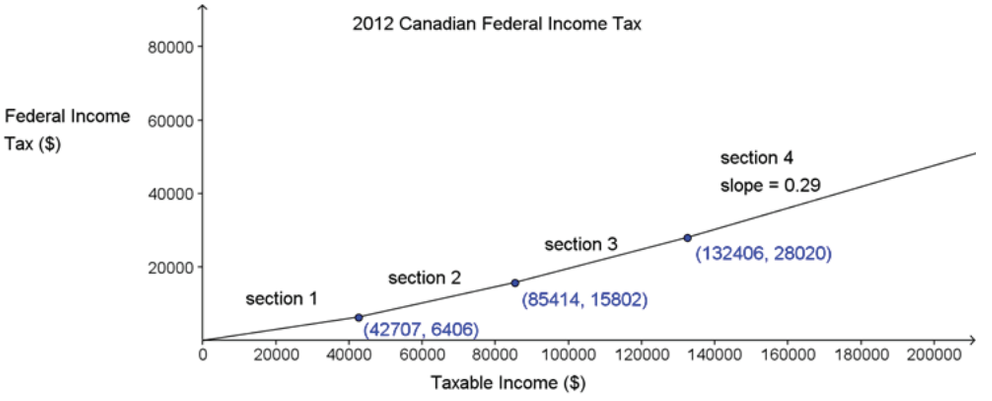
	Tile A	Tile B	Tile C	Tile D
Tile dimensions (in.)	12 × 24	18 × 18	3 × 6	12 × 12
Tiles per carton	8	6	43	15
Price per carton	$31.84	$39.99	$23.77	$33.35

List the tiles from least to greatest cost for the project.

Answer is A, B, D, C

4

2. In Canada, federal income tax is calculated as a percent of your taxable income. As you earn more, the rate of taxation also increases.

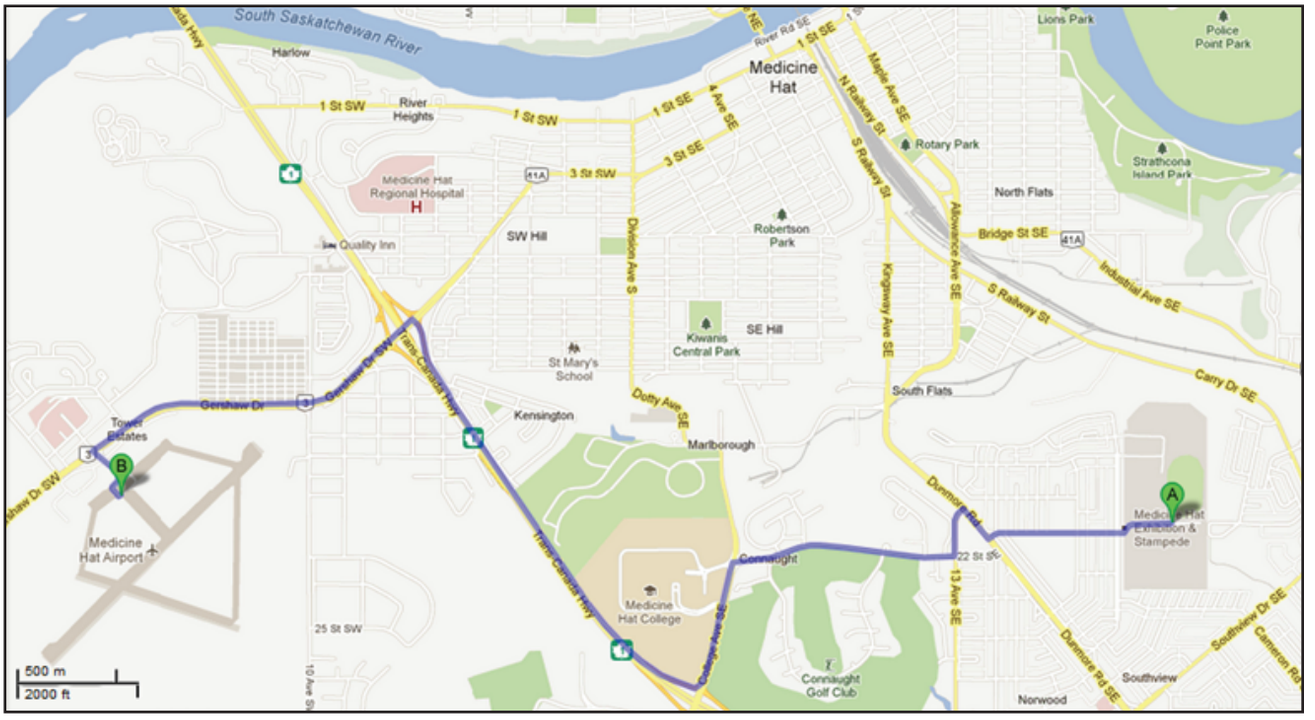


a. Determine the slope of section 1, section 2, and section 3.

Answer is section 1 slope = 0.15, section 2 slope = 0.22, section 3 slope = 0.26

b. Explain what the slopes represent.

(3) 3. Estimate the driving distance from the Medicine Hat Exhibition and Stampede to the Medicine Hat Airport.



© *maps.google.ca*

Answer is approximately 8 km

(2) 4. A bushel is a unit of volume often used to measure dry, agriculture commodities, and one bushel is approximately 32 L. A 1:50 scale model of a grain bin is capable of holding 0.112 bushels. How many bushels can the full-size bin hold?

Answer is 14 000 bushels

Unit 6: Statistics

Concepts	I know how to do that	I'm going to review that topic
Explain what standard deviation means and how it can be used to compare data sets.		
Calculate the mean and standard deviation of a set of data using technology.		
Use an example to describe the properties of a normal curve.		
Determine if a data set is approximately normal.		
Compare the properties of two normally distributed data sets.		
Determine areas under a normal curve.		
Determine a z-score from an area under a normal curve.		
Solve problems that use the normal distribution.		
Explain what confidence interval, margin of error, and confidence level mean.		
Describe how the sample size is related to the margin of error, confidence intervals, and confidence level.		
Make predictions about a population from sample data.		
Support a position by analyzing statistical data presented in the media.		

Unit 6: Statistic Review Questions

(3) 1. In NCAA volleyball, a set consists of teams playing until one team reaches 25 points and has at least a two point advantage. A player is awarded a service ace if she serves the ball, it crosses the net, and lands in-bounds before an opposing player can touch it, or the opposing player touches it and then it hits the ground.

The following two tables show the number of aces per set for the top 10 freshmen and the top ten seniors of the NCAA during the 2012 season.

Freshmen	Aces Per Set
Savannah Blinn	0.51
Karin Palgutova	0.46
Brooke Stamnes	0.46
Daly Santana	0.44
Lauren Behrens	0.43
Kryssi Daniels	0.43
Julia Doyle	0.37
Taylor Edwards	0.37
Samantha Bricio	0.36
Claire Van Dyk	0.35

Seniors	Aces Per Set
Christine Edwards	0.95
Monique Mead	0.48
Sydney Kordic	0.44
Jessica Hays	0.43
Krysta Gardner	0.42
Kaytlyn Dill	0.41
Jocelyn Levig	0.41
Kim Black	0.41
Megan Munce	0.41
Courtney Johnk	0.40

Courtesy: www.ncaa.com

a. Determine the mean and standard deviation for each group.

	Freshmen	Seniors
μ		
σ		

b. Describe how the two groups compare.

c. Repeat part a. and b. without Savannah Blinn and Christine Edwards. Explain the change.

3

2. Consider the following data set.

105	106	95	96	116	94	99	120	113	107
88	90	113	107	116	91	105	77	110	83
99	99	82	86	96	102	81	112	106	89
94	109	68	82	83	116	81	68	84	96
90	109	101	100	102	115	86	105	104	104

a. Is the data set normally distributed? Explain.

Answer is yes

b. Determine the z-score of a data value of 123.

Answer is 2

c. Based on the z-score, what percentage of data values do you expect to be above 123?

Answer is 2.2%

(3)

3. The thickness of paper is often measured using basis weight: the weight of 3000 square feet of that paper in a roll. The statistics for three truckloads of paper rolls that were expected to have basis weights of 40 pounds are shown in the table below.

	Mean (lbs.)	Standard Deviation
Lot 1	41.20	0.59
Lot 2	42.14	0.89
Lot 3	42.61	1.19

a. Describe how the three truckloads compare.

b. Assuming the basis weights are normally distributed, what is the percentage of Lot 1 rolls with basis weights above 40 pounds?

Answer is 97.9%

c. Assuming the Lot 3 basis weights are normally distributed, over which weight will 90% of the rolls lie?

Answer is 41.09 lbs

(3) 4.

Table 1
Percentage distribution of children and adolescents, by body mass index (BMI) category (based on World Health Organization cut-offs), age group and sex, household populations aged 5 to 17, 2009 to 2011

	Thinness			Normal weight			Overweight			Obesity		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
	%	from	to	%	from	to	%	from	to	%	from	to
Total	2.2[E]	1.1	4.1	66.4	62.8	69.8	19.8	16.6	23.4	11.7	9.9	13.7
Age group (years)												
5 to 11	F	…	…	65.5	61.7	69.2	19.7	16.4	23.4	13.1	10.5	16.3
12 to 17	F	…	…	67.2	60.2	73.6	19.9	15.0	25.8	10.2	7.3	14.1
Boys	F	…	…	62.3	56.3	68.0	19.4	15.1	24.4	15.1	12.6	17.9
Age group (years)												
5 to 11	F	…	…	59.0	51.9	65.7	19.8	14.8	26.0	19.5	15.5	24.1
12 to 17	F	…	…	65.6	55.3	74.6	18.9[E]	12.6	27.5	10.7*	7.5	15.0
Girls	1.0[E]	0.6	1.6	70.8	64.6	76.3	20.2	15.8	25.6	8.0[†]	5.7	11.1
Age group (years)												
5 to 11	1.5[E]	0.7	3.1	72.6[†]	69.8	75.2	19.6	16.1	23.6	6.3[†E]	4.1	9.8
12 to 17	F	…	…	69.0	58.5	77.9	20.9	14.9	28.6	9.6[E]	6.0	15.1

* significantly different from ages 5 to 11 ($p<0.05$)
[†] significantly different from boys ($p<0.05$)
[E] use with caution
F too unreliable to be published
… not applicable
Source: 2009 to 2011 Canadian Health Measures Survey.

Source: www.statcan.gc.ca

a. Describe the information given in the table.

b. Determine the margin of error for overweight boys.

Answer is 4.65 percentage points

c. Predict how this margin of error would change if a 99% confidence level had been used.

After all required components of Units 1 to 7 have been completed, marked and returned to you, review the concepts. Contact your teacher to discuss any concepts that you are unsure about. When you are ready, contact your exam supervisor or your local ADLC office to schedule an appointment to write the Final Exam.

Course Evaluation Questions

Please answer the following questions to help us improve the course. Please consider all aspects of the course in your responses, such as examples, practice exercises, videos, applets, assignments, quizzes, exams, the seven units, and the course project. The more detail you can provide, the more helpful your responses will be.

1. Why did you take Math 20-2?

2. What did you like about the course?

3. What didn't you like about the course?

4. In what part of the course did you learn the most?

5. What part(s) of the course did you find easiest to learn? The hardest to learn?

6. If you could make a change to the course, what would it be?


LEARNING
ANYTIME ANYWHERE