Mathematics 11 Foundations of Mathematics

Textbook

This course uses the textbook "Foundations of Mathematics 11"
ISBN-13: 978-0-17-650270-6
by Nelson Education Press at 1- 800-268-2222. Price is about $ 85.

Curriculum Outline

Unit 1 Properties of Angles and Triangles	**Unit 2 Acute Triangle Trigonometry**
Unit 3 Oblique Triangle Trigonometry	**Unit 4 Systems of Linear Inequalities**
Unit 5 Quadratic Functions and Equations	**Unit 6 Inductive and Deductive Reasoning**
Unit 7 Statistical Reasoning	**Unit 8 Proportional Reasoning**

Structure

This course is generally designed with the self-paced student in mind. It is based on a mastery system in which the student must obtain an 80% on the tests. Each chapter has two versions in which the student has a chance to reach and or exceed the 80% mastery level.

Evaluation

There are 8 chapter tests which account for 60% of the final mark. There are 3 cumulative tests which account for 40% of the final mark.

Composition

The course is made up of:
8 Chapters Outlines,
8 Chapter Tests each with an A and a B version (16 tests), Plus (16 tests) Answer Keys
3 Cumulative Tests, Plus (3 Cumulative Tests) Answer Keys,
All Answer Keys have a suggested marking scheme,
All files are put on disk in pdf and MS Word,
A perpetual license for your school.
The entire paper course is placed in a binder along with the disk and shipped as one unit.
Cost: $ 450.00. See Ordering

Mathematics 11: Foundations of Mathematics

Record Chart

Name:	Start Date:

	Unit	Topic	Test A	Test B	Average	Date
	1	Properties of Angles and Triangles				
	2	Acute Triangle Trigonometry				
	3	Oblique Triangle Trigonometry				
	Cumulative Test 1					
	4	Systems of Linear Inequalities				
	5	Quadratic Functions and Equations				
	Cumulative Test 2					
	6	Inductive and Deductive Reasoning				
	7	Statistical Reasoning				
	8	Proportional Reasoning				
	Cumulative Test 3					

Course Evaluation

Course Evaluation	Total Marks	Out of	Percent	Value	Result
Tests (7)				60%	
Cumulative Tests (3)				40%	
Final Mark					

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Textbook: Foundations of Mathematics 11 by Nelson

Unit 5 Quadratic Functions & Equations - Chapter 7

Goal: The goal of this chapter is to further develop algebraic and graphical reasoning.

Objectives: In order to achieve the above goal you will model and solve problems algebraically and graphically by using:

(a) quadratic functions.

(b) solve quadratic functions by graphing, factoring, and using the quadratic formula.

(c) solve problems modeled on quadratic functions and equations,

What Needs to be Done:

Unit 5 has 8 sections: 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, and 7.8. Each section in unit 7 has an accompanied video to for a section.
Use the section-numbered videos below as they correspond in the **Unit Practice Guide** below to help you with your understanding.

Video Selections:

7.**1** **https://www.youtube.com/watch?v=fDj0u2CNSoc**
Exploring Quadratic Relations (4:49 min)

7.**2** **https://www.youtube.com/watch?v=yzzHMhzFbzA**
Properties of Graphs of Quadratic Functions (4:36 min)

7.2 **https://www.youtube.com/watch?v=xAnTbbxSLnY**
Graphs of Quadratic Functions (5:26 min)

7.3 **https://www.youtube.com/watch?v=hcng4zEpSVg**
Solving Quadratic Equations by Graphing (12:53 min)

7.4 **https://www.youtube.com/watch?v=C8YcqPLAz3A**
Quadratic Relations of the Form y = a(x r)(x s) (7:41 min)

7.4 **https://www.youtube.com/watch?v=2K9Wf3FznVU**
Factored Form of Quadratic Function.mp4 (9:20 min)

7.5 **https://www.youtube.com/watch?v=1RknGmFnJiU**
Solving Quadratic Equations Using the TI-83 Calculator (7:10 min)

7.5 **https://www.youtube.com/watch?v=SDe-1lGeS0U**
Solving Quadratic Equations by Factoring - Basic Examples (7:18min)

7.6 **https://www.youtube.com/watch?v=y99lNRqLjBA**
Quick Way of Graphing a Quadratic Function in Vertex Form (3:53 min)

7.7 **https://www.youtube.com/watch?v=JSwjmTFMDwg**
Solving Quadratic Equations using the Quadratic Formula (4:27 min)

7.8 **https://www.youtube.com/watch?v=RE732MTV-dk**
Solving Problems using Quadratic Models (8:15 min)

7.8 **https://www.youtube.com/watch?v=IGGnn9oa4QY**
More Word Problems Using Quadratic Equations - Example 1(4:57 min)

Quadratic Functions & Equations

Unit 5 Practice Guide - Chapter 7

(Check Mark as You Complete)

✓	Page	
☐	358	Read over "Explore the Math". **Watch video** "**Exploring Quadratic Relations" (4:49 min).**
☐	359	Read over "In Summary".
☐	360	Under "Further Your Understanding" do # 1-6.
☐	361-362	Read over "Learn About the math". Go over Example 1.
☐	363-364	Go over "Apply the Math".
☐	365-367	Go over Examples 3 and **watch video "Graphs of Quadratic Functions" (5:26 min)** and go over Example 4.

	368-369	Read over "In Summary". **Watch video "Properties of Graphs of Quadratic Functions" (4:36 min).** Under "Check Your Understanding" try # 1-3.
	369-372	Under "Practising" try # 4, 5ac, 6, 7i, 8, 9ac, 10, 11i and iv, 12, 14, and 16.
	373-378	Read over "Investigate the Math" and **watch video "Solving Quadratic Equations by Graphing" (12:53 min).** Go over Examples 1-3.
	379-381	Read over "In Summary". Under "Check Your Understanding" try # 1-4. Under "Practising", try # 5ac, 6ac, 7, 8ac, 10, and 13.
	383-389	**Watch video "Quadratic Relations of the Form y = a(x r)(x s)" (7:41 min).** Go over Examples 1-4.
	390	Read over "In Summary". **Watch video "Factored Form of Quadratic Function.mp4" (9:20 min).**
	391	Under "Check Your Understanding" try # 1abc, 2ab and 3.
	391-395	Under "Practising, try # 4acf, 5, 7, 8, 10ace, 11ad, 13, 15, 17 and 19.
	398	Under "Practising, try # 1ad, 2, 3, 4, 6, 8, 9, 10 and 12.
	399-404	Read over "Learn About the Math". Watch video **"Solving Quadratic Equations Using the TI-83 Calculator" (7:10 min)** Go over Examples 1- 5. **Watch video "Solving Quadratic Equations by Factoring - Basic Examples" (7:18 min).**
	405-407	Read over "In Summary". Under "Check Your Understanding" try # 1ad and 2aceg. Under "Practising, try # 3ad, 4ad, 5, 6ad, 7, 8, 9, 10, 12, 13 14, and 18.
	408	Read over "Investigate the Math". **Watch video "Quick Way of Graphing a Quadratic Function in Vertex Form" (3:53 min)**
	410-415	Go over Examples 1-4.
	416	Go over "In Summary".
	417	Under "Check Your Understanding" try #1ace and 2ace.
	417-421	Under "Practising", try # 4, 5, 6, 7, 8, 11, 12, 14, 17, 18, and 19.
	422-426	Watch video **"Solving the Quadratic Equation using the Quadratic Formula" (4: 27 min).** Go over Examples 1-4.
	427-429	Read over "In Summary" and under "Check Your Understanding" try # 1ad, 2ad, 4ad, 6ad, 7, 8, 10, and 11.
	431-434	**Watch video "Solving Problems using Quadratic Models" (8:15 min).** Go over Examples 1-3.
	435	**Watch video "More Word Problems Using Quadratic Equations - Example 1"(4:57 min).** Go over Example 4.

☐	436-438	Read over “In Summary” and Under “Practising” try # 2, 3, 5, 7, and 11.
☐	440	Under “Chapter Self-Test” try # 1ad, 2a, 3, 5, 6ad, 7ad and 8.
☐	443-444	Under “Practising” try # 1b, 2, 4ac, 5, 8ac, 9, 11, 13ac, 15, and 17.

Since this course is based on the mastery system, you need to reach 80% in the test before you can proceed to the next chapter, so review your problems and when you are ready, ask your instructor for the test.

Math 11 Foundations Unit 4 Test A: Systems of Linear Inequalities

Name_____ **Date** _____ _____

Marks **45**

1. Match the descriptions on the bottom with the corresponding letter to the terms on the left.

5 _____ Linear inequality

_____ Solution set

_____ Continuous

_____Solution region

_____ Half plane

_____ Optimal solution

_____ Constraint

_____ Objective function

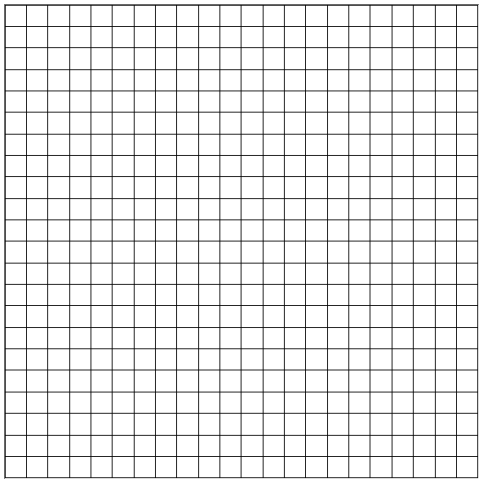
_____ Feasible region

_____ Discrete

A. A limiting condition of the optimization problem.
B. The part of a graph that represents the solution set.
C. A relationship between two expressions where one may have symbols such as ≥, ≤, >, and <.
D. A connected set of numbers where there is always another number between any two others.
E. The point in the solution set that represents the maximum or minimum value of the objective function.
F. The equation that represents the relationship between the two variables in the system of linear inequalities and the quantity to be optimized.
G. The region on one side of the graph of a linear relation on a Cartesian plane.
H. Consisting of separate or distinct parts.
I. The solution region for a system of linear inequalities that models an optimization problem.
J. The set of all possible solutions.

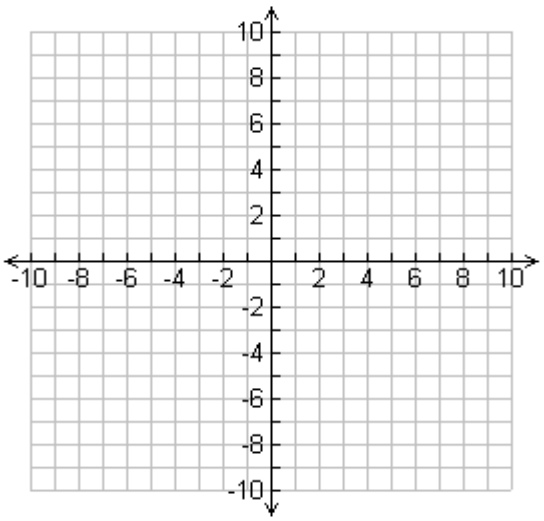
2. Graph the solution set for this inequality. $-8x + 4y \leq 12$

2



3 . Graph the solution set for the following inequality on the Cartesian Plane below.
$\{ (x,y) \mid -2y + 4 \geq -8 + y , x \in I, y \in I \}$

2

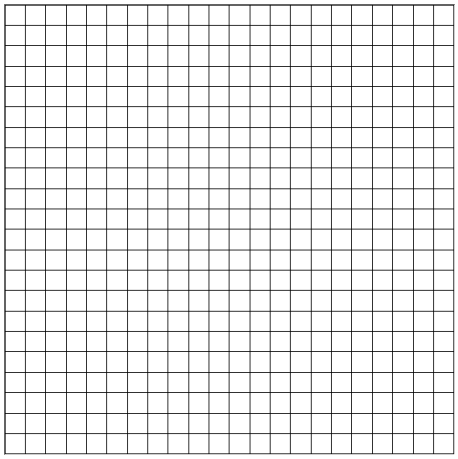


4. A sports store sells softball bats for $100 each and sells hardball bats for $ 150 each. The owner wants to have revenue of at least $ 1500.00 per day for the combined sales in bats. (a) Graph the combinations that will meet his sales target.

(b) What restrictions are there on the domain and range?

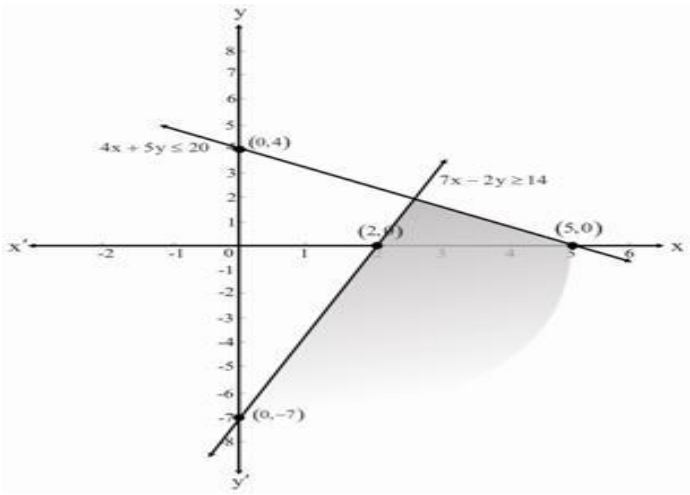
(c) Select one combination and state its characteristics.

4



5. For the following system of linear inequalities describe what you can infer from the graph ($4x + 5y \leq 20$ and $7x - 2y \geq 14$) about the restrictions on the domain and range of the solution.

3



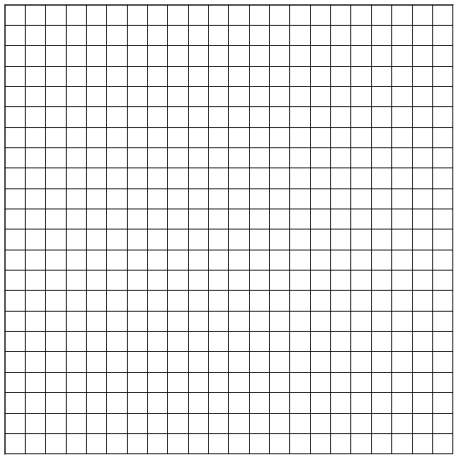
Graph courtesy of www.emathzone.com

6. For the following linear inequality system

(a) Graph the solution set.
(b) Describe the solution region.
(c) Determine a solution and check its validity.

$\{ (x,y) \mid 3x + 10y > 42, x \in W, y \in W \}$
$\{ (x,y) \mid 6x - 18 \leq 3y, x \in W, y \in W \}$

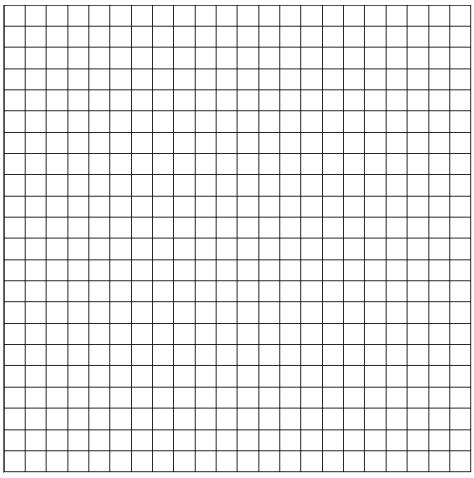
5



7. A catering company is making two types of appetizers: tapas and sushi. Up to a maximum of 900 appetizers are needed but there are to be at least three times as many sushi appetizers compared to tapas.

(a) Write a system of inequalities that models this situation and define the variables.
(b) Outline the restrictions on the variables.
(c) Sketch a graph to determine the solution set.
(d) State two combinations of numbers of appetizers that could be used to prepare the appetizers.

6



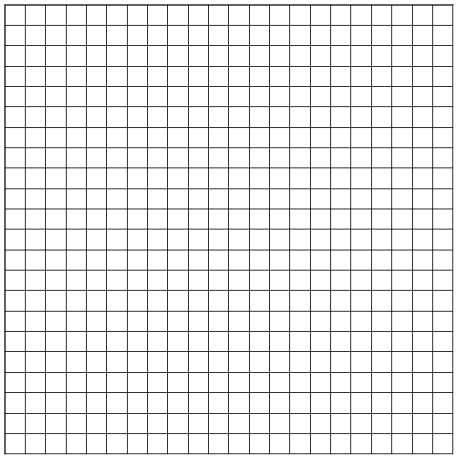
8. The following model represents an optimization problem. Determine the maximum solution.

3 Optimization Model

Restrictions: $c \in R, d \in R$

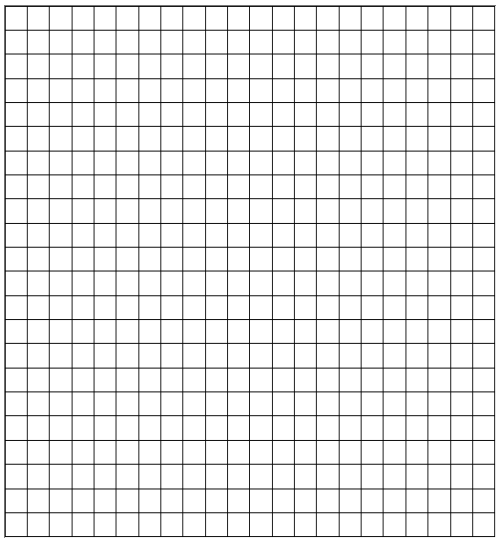
Constraints: $c \geq 0, d \geq 0, 3c + 4d \leq 36, c + d \geq 6$

Objective function: $S = 2.5c + 5.5d$



9. A hockey team needs help to coordinate their trip to the playoffs in Kelowna BC. The team is made up of 22 players and 2 coaches. Due to the abundance of equipment, the team needs to use minivans and SUVs. Each minivan can accommodate 4 members and each SUV 6 members of the team but only 6 minivans and 4 SUVs are available. The coordinator wants to determine the combination of minivans and SUVs that will require the minimum and maximum number of vehicles. Create a model to represent this situation. State a combination that will maximize and minimize vehicles.

8



10. Anthony has two jobs during the winter season. He works three days as a ski instructor which gets him no more than 18 hours and gets paid 15.50 per hour. In his second job Anthony tutors students in math and science. This job pays him $ 20.00 per hour and he works no less than 12 hours. If he works no more than 35 hours per week, what combination of hours will allow him to maximize his earnings? What can he expect to earn?

6