

## Mathematics 10 F&PC

|                 |                                     |
|-----------------|-------------------------------------|
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### Textbook

This course uses the two Workbooks and the textbook “*Mathematics 10*”

ISBN 9780070002470 • 0070002479

by McGraw Hill Ryerson. 1-800-565-5758 Price is about \$ 85.

### Curriculum Outline

|   |   |   |
|---|---|---|
| <b>Unit 1 Financial Literacy Workbook</b>                     | <b>Unit 2 Arithmetic Sequences Workbook</b>                     | <b>Unit 3 Exponents and Radicals</b>      |
| <b>Unit 4 Polynomials</b>                                     | <b>Unit 5 Linear Relations and Functions</b>                    | <b>Unit 6 Linear Equations and Graphs</b> |
| <b>Unit 7 Solving Systems of Linear Equations Graphically</b> | <b>Unit 8 Solving Systems of Linear Equations Algebraically</b> | <b>Unit 9 Trigonometry</b>                |

### 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 unit has two versions in which the student has a chance to reach and or exceed the 80% mastery level.

### Evaluation

There are 9 unit tests which account for 70% of the final mark. There are 4 cumulative tests which account for 30% of the final mark.

### Composition

The course is made up of:

9 Unit Outlines,

9 Unit Tests, each with an A and a B version (18 tests), Plus (18 tests) Answer Keys

4 Cumulative Tests, Plus (4 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: \$ 495.00. See Ordering on website**

## Math 10 Foundations of Mathematics and Pre-calculus

### Record Chart

Name:

Start Date:

| Chapter                | Topic   | Test A | Test B | Average | Date |
|------------------------|---|--------|--------|---------|------|
| 1                      | Financial Literacy                                |        |        |         |      |
| 2                      | Arithmetic Sequences                              |        |        |         |      |
| Cumulative Test Unit 1 |   |        |        |         |      |
| 3                      | Exponents and Radicals                            |        |        |         |      |
| 4                      | Polynomials                                       |        |        |         |      |
| Cumulative Test Unit 2 |   |        |        |         |      |
| 5                      | Linear Relations                                  |        |        |         |      |
| 6                      | Linear Equations and Graphs                       |        |        |         |      |
| Cumulative Test Unit 3 |   |        |        |         |      |
| 7                      | Solving Systems of Linear Equations Graphically   |        |        |         |      |
| 8                      | Solving Systems of Linear Equations Algebraically |        |        |         |      |
| Cumulative Test Unit 4 |   |        |        |         |      |
| 9                      | Trigonometry                                      |        |        |         |      |

| Course Evaluation    | Total Marks | Percent | Value | Result |
|----------------------|-------------|---------|-------|--------|
| Tests (10)           |             |         | 70%   |        |
| Cumulative Tests (4) |             |         | 30%   |        |
| Total                |             |         |       |        |
| Final Mark           | Date:       |         |       |        |

# Math 10 Foundations of Mathematics and Pre-calculus

## Unit 1 Financial Literacy Workbook

### Types of Income

#### Hourly Wage

**Each province and territory have their own minimum wage which refers to the legal minimum amount paid per hour. This rate varies across Canada. As of Oct. 2017 these are the rates for Western Canada**

|          |          |
|----------|----------|
| Alberta  | \$ 13.60 |
| B. C.    | \$ 11.35 |
| Manitoba | \$ 11.15 |
| NW Terri | \$ 12.50 |
| Nunavat  | \$ 13.00 |
| Sask.    | \$ 10.96 |
| Yukon    | \$ 11.32 |

Video: Calculate Earnings Given An Hourly Wage

<https://www.youtube.com/watch?v=a-wqLL5i8hc>

**Problem:** Aliysha works in Kelowna BC, for 25 hours per week at minimum wage at a gas station. What are the weekly earnings?

**Solution:** Minimum wage in BC is 11.35 per hour x 25 hours = \$ 283.75

**Problem: Try the following.**

1. Chapa works for 37.5 hours per week in NW Territories. What is his weekly wage?

**Hourly Rate and Overtime****Video: Hourly Rate and Overtime**

<https://www.youtube.com/watch?v=yHRuXVipIU0>

**Overtime can occur when a labourer works past an 8 hour day. It can be paid in terms of time and a half (1.5) or double time (2.0).**

**Problem:** Anthony works at Suprema, a roof materials manufacturing company. His regular pay of \$16.80 per hour is during the AM shift. There is overtime after 40 hours. On Saturdays overtime is 1.5 and on Sunday it is double time the shift rate. Calculate his week gross earnings.

|          | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|----------|--------|---------|-----------|----------|--------|----------|--------|
| AM Shift | 8      | 8       | 8         | 8        | 8      | 4        | 4      |

**Solution:**

$$40 \text{ hours} \times 16.80 = 672.00$$

$$4 \text{ hours} \times 1.5 \times 16.80 = 100.80$$

$$4 \text{ hours} \times 2.0 \times 16.80 = \underline{134.40}$$

$$\text{The first week gross earnings} \quad \$ 907.20$$

**Problem: Try the following.**

6. Awan works at Suprema, a roof materials manufacturing company. His regular pay of \$17.30 per hour is during the PM shift. There is overtime after 40 hours. On Saturdays overtime is 1.5 and on Sunday it is double time the shift rate. Calculate his weekly gross earnings.

|          | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|----------|--------|---------|-----------|----------|--------|----------|--------|
| PM Shift | 8      | 8       | 8         | 8        | 8      | 3        | 3      |

## Foundations of Mathematics & Pre-calculus 10

### Unit 2 Arithmetic Sequences Workbook

**A sequence is a set of numbers called terms that are in order. For example 1, 3, 5, 7, ... These terms are increasing by two each time.**

**An arithmetic sequence proceeds with one term and goes to the next term by adding or subtracting the same number. For example 5, 7, 9, 11, 13, ... is an arithmetic sequence because the number two is added to each term.**

**For example 22, 19, 16, 13, 10, 7, 4, 1, -2, -5, ... is an arithmetic sequence because three is subtracted from each term.**

**Problem 1: Identify whether the following are arithmetic sequences**

- (a) 0, 2, 4, 7, 9, 11, 14, 16, 19, ...
- (b) 7, 14, 21, 28, 35, 42, 49, 56, ...
- (c) -2, -5, -8, -11, -14, -17, -20 ...
- (d) -35, -30, -24, -20, -15, -11, ...

**The number added or subtracted from one term to the next in an arithmetic sequence is called the common difference and is recognized by the letter "d".**

**Problem 2: Determine the common difference from the following.**

- (a) 1, 3, 5, 7, 9, ...
- (b) -12, -7, -2, 3, 8, 13, ...
- (c) 10, 20, 30, 40, 50, 60, ...
- (d) 8, 16, 24, 32, 40, 48, 56, 64, ...
- (e) 7, 0, -7, -14, -21, -28, -35, ...

# Math 10 Foundations and Pre-calculus

Textbook: Mathematics 10 by McGraw-Hill Ryerson

## Unit 6 Linear Relations

**Goal:** The goal of this unit is to familiarize you with linear relations and functions.

**Objectives:** During this unit you will focus on the characteristics of graphing linear relations and functions. You will work with function notation and use slope to solve problems. You will encounter terms such as:

Linear and non-linear relations, continuous and discrete data, dependent and independent variable, domain and range, function notation, the vertical line test for functions, and slope.

### What Needs to be Done:

Unit 6 has 5 sections: 6.1, 6.2, 6.3, 6.4, 6.5. Each section in unit six has an accompanied video to enhance your understanding of the section material. There may be more than one video 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:

**6.1** <https://www.youtube.com/watch?v=VeZ91YlGvDg>

Graphing Relationships (10:56 min)

**6.2** <https://www.youtube.com/watch?v=qPx7i1jwXX4> Exploring Linear Relationships. (5 min)

**6.3** <https://www.youtube.com/watch?v=C6F33Ir-sY4> Domain and Range (3min 36 sec)

**6.4** <https://www.youtube.com/watch?v=VhokQhjl5t0> Introduction to Functions (9 min 32 seconds)

**6.5** <https://www.youtube.com/watch?v=hXP1Gv9IMBo> Slope. (8 min 27 secs)

**Unit 6 Practice Guide:** (Check Mark as You Complete)

|         |   |
|---------|---|
| ✓ Page  |   |
| 268-270 | Read over these pages. <b>Watch video 6.1 Graphing Relationships</b>  |
| 271-273 | Read over and work through the examples.  |
| 274-278 | Do the practice and apply questions, correcting your work as you go. Select several questions from the extend and connections sections to expand your skills. |
| 279-281 | Read over. <b>Watch video 6.2 Exploring Linear Relationships</b>  |
| 282-286 | Read and work through the examples.   |
| 287-291 | Do the practice and apply questions, correcting your work as you go. Select several questions from the extend and connections sections to expand your skills. |
| 292-295 | Read over. <b>Watch video 6.3 Domain and Range.</b>   |
| 295-301 | Read over and work through the examples.  |
| 301-304 | Do the practice and apply questions, correcting your work as you go. Select several extend and connections questions to expand your skills.                   |
| 305-306 | Read over. <b>Watch video 6.4 Introduction to Functions</b>   |
| 306-310 | Read and work through the examples.   |
| 311-314 | Do the practice and apply questions, correcting your work as you go. Select several questions from the extend and connections sections to expand your skills. |
| 315-318 | Read over. <b>Watch video 6.5 Slope</b>   |
| 319-324 | Read and work through the examples.   |
| 325-329 | Do the practice and apply questions, correcting your work as you go. Select several questions from the extend and connections sections to expand your skills. |
| 330-337 | Do the review and practice test. Check your work. Review as needed  |

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

## Math 10 F&PC Unit 6 Test A: Linear Equations and Graphs

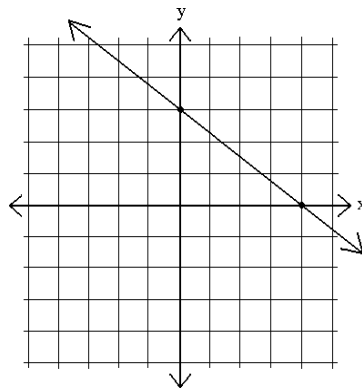
Name \_\_\_\_\_ Date \_\_\_\_\_

**40**

Marks

1. What is the equation of the line of the graph below?

2



2. Determine the slope and y intercept of the following lines.

2

a.  $y = 3x + 2$

2

b.  $y = -2x - 7$



2                      c.  $y = 1/2x$

2                      d.  $y = 2$

7. A bank employee is paid 15.75 per hour in a 38.5 hour work week. She also received a \$4500.00 bonus at Christmas.

- (a) How much did she receive for the whole year?  
(b) Calculate what her hourly rate would be with the bonus.

4

8. A person is paid \$3.50 per half-bushel of pears picked. How much does the person earn after picking 72 bushels of pears?

2

9. A real estate sales person makes a commission on the sale of a house. If the first \$ 100,000.00 is at 8% and the rest at 4%, what amount does the sales person make if the house sold for \$675000?

3

10. A taxi company signed a contract for \$14000 for a 4 weeks period. The taxi company's running expenses were \$3750.00 per week. How much profit was made in the contract?

2

13. Dena works as research assistant at the University of British Columbia. She makes an annual salary of \$ 68570.00 and has a claim code of four. Her weekly deductions are union dues \$ 60.75 and the company pension \$ 185.00. Determine the following by filling in the weekly pay statement. For taxes use the Federal and Provincial Tax Tables provided.

- |                      |                      |                     |
|----------------------|----------------------|---------------------|
| (a) Rate             | (b) Gross earnings   | (c) Deduction total |
| (d) Federal tax      | (e) Provincial tax   | (f) CPP             |
| (h) EI               | (i) Taxable earnings | (j) Taxes, CPP, EI  |
| (k) Total deductions | (l) Net pay          |                     |

10

|                      |
|----------------------|
| <b>Pay Statement</b> |
|----------------------|

|  |
|--|
| <b>Company: University of British Columbia</b> |
|--|

|                |                              |
|----------------|------------------------------|
| Employee Name: | Dena Peters                  |
| Pay Period     | 14 Mar. 2018 to 21 Mar. 2018 |
| Rate per week  |                              |
| Gross Earnings |                              |

|                   |  |
|-------------------|--|
| <b>Deductions</b> |  |
| Types             |  |
| Union Dues        |  |
| Pension           |  |
| Total             |  |

|                |        |
|----------------|--------|
| <b>Taxes</b>   |        |
| Types          | Amount |
| Federal        |        |
| Provincia<br>1 |        |
| CPP            |        |
| EI             |        |

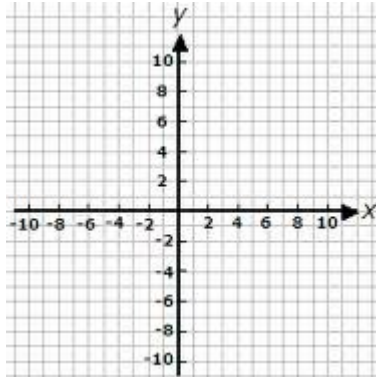
|                          |
|--------------------------|
| <b>Paycheque Summary</b> |
|--------------------------|

| Gross Earnings | Taxable Earnings | Taxes, CPP, EI | Total Deductions | Net Pay |
|----------------|------------------|----------------|------------------|---------|
|                |                  |                |                  |         |

3. Sketch the following graphs.

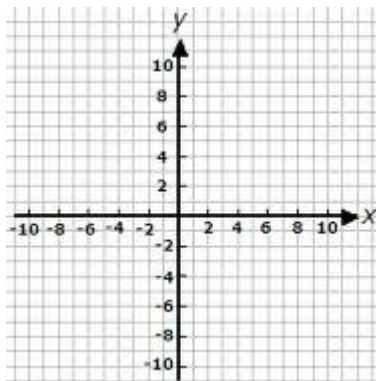
3

a.  $y = x - 4$



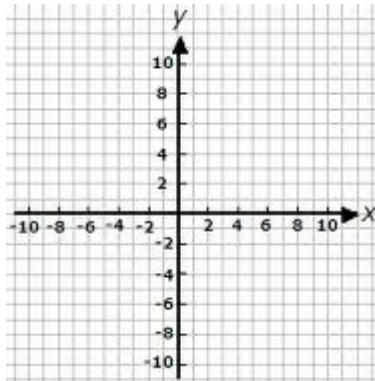
3

b.  $y = 2x + 1$



3

c.  $y = 1$



**Math 10 Foundations of Mathematics and Pre-calculus**  
**Unit 2                      Arithmetic Sequences**

Name \_\_\_\_\_ Date \_\_\_\_\_

**Marks**

**55**

1. Use the following formula to identify the letters.

$$t_n = t_1 + (n - 1) d$$

2

\_\_\_\_\_ d

\_\_\_\_\_ n

\_\_\_\_\_  $t_1$

\_\_\_\_\_  $t_n$

- A. is the general term
- B. is the first term.
- C. is the common difference.
- D. is the number of terms.

2. Circle the letter that represents an arithmetic sequence.

- (a) 0, 3, 4, 7, 8, 11, 14, 16, 19, ...
- (b) 7, 14, 21, 29, 35, 42, 48, 56, ...
- (c) -2, -5, -8, -12, -13, -16, -20 ...
- (d) -32, -37, -42, -47, -52, -57, ...

1

3. Circle the correct letter for the missing terms.  $11, t_2, t_3, 5, 3, \dots$

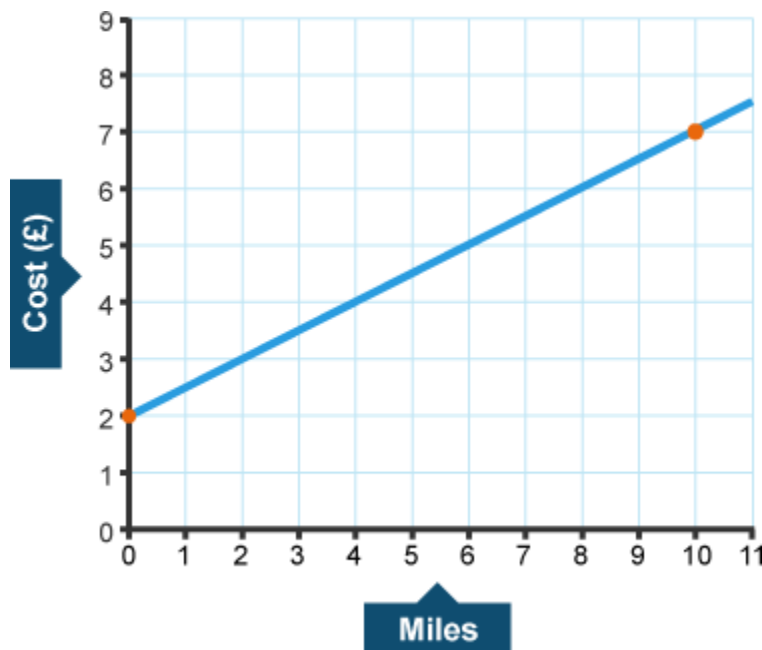
- (a) 11, 9, 7, 5, 3, ...
- (b) 11, 10, 9, 5, 3, ...
- (c) 11, 9, 8, 5, 3...
- (d) 11, 10, 8, 5, 3...

1

14. The following graph shows the relationship between the costs of driving a car based on the miles driven.

- (a) Assume that the starting point begins with one, list the first ten terms.
- (b) Determine the general term.
- (c) What is the cost at 100 miles?
- (d) What is the cost at 12 000 miles?

5



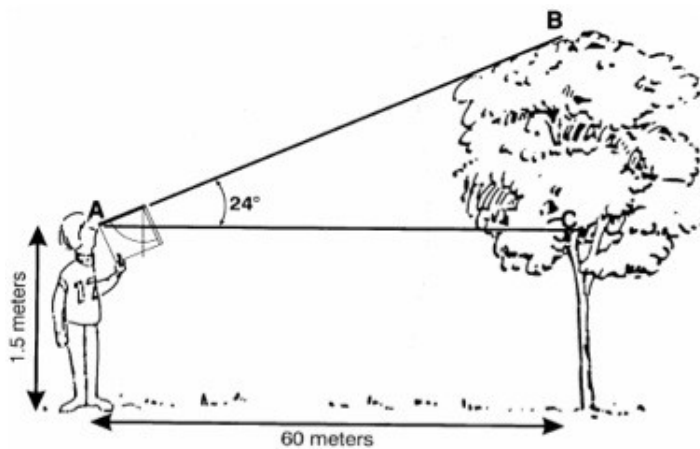
15. A desert locust swarm can pack between 40 and 80 million locusts into less than half a square mile. Assume that the growth rate of locust follows an arithmetic sequence. The initial situation begins with 50000 locust and after an hour it reaches 150000. At the two hour mark the population reaches 250000.

- Determine the general term.
- Calculate how long it will take to form a swarm of 40 million.
- Determine this time in weeks to one decimal place.

6

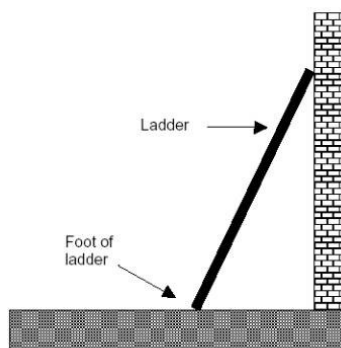
5. The following student used a clinometer to determine the height of the tree. What was the height to the nearest tenth?

3



6. A ladder is placed 3.25 feet from the wall. If the length of the ladder is 14 feet, what is the angle to one decimal place made at ground level?

2



7. In drafting class a student drew this diagram of a wheelchair entrance ramp for a school.

4



- (a) If the height of the ramp is 120 cm, what is the ramp length to the nearest whole number?  
 (b) What is the horizontal distance to the nearest whole number that the ramp will take up?

## Math 10 Foundations of Mathematics and Pre-calculus

### Unit 7 Systems of Linear Equations

Name \_\_\_\_\_ Date \_\_\_\_\_

# 55

Marks

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

- 3 \_\_\_\_\_ Solution  
 \_\_\_\_\_ Coincident  
 \_\_\_\_\_ System of linear equations  
 \_\_\_\_\_ Equivalent linear system  
 \_\_\_\_\_ Linear system  
 \_\_\_\_\_ Infinite

- A. It can be formed from two equations in two variables.  
 B. It can be referred to as a system of linear equations.  
 C. It can be a pair of values of  $x$  and  $y$  that satisfy both equations.  
 D. It has the same solution as the original system.  
 E. It is unlimited.  
 F. It is when the lines have the same slope and the same  $y$ -intercept.

2. Determine the solution of the following linear system.

1

