Mathematics 12 Foundations of Mathematics

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Textbook

This course uses the textbook "Foundations of Mathematics 12"
ISBN-13: 978-0-17-65273-7
by Nelson Education Press at 1- 800-268-2222. Price is about $ 85.

Curriculum Outline

Chapter 1 Financial Mathematics: Investing Money	**Chapter 2 Financial Mathematics: Borrowing Money**
Chapter 3 Set Theory and Logic	**Chapter 4 Counting Methods**
Chapter 5 Probability	**Chapter 6 Polynomial Functions**
Chapter 7 Exponential and Logarithmic Functions	**Unit 8 Sinusoidal Functions**

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 4 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
4 Cumulative Tests each with an A and a B version, Plus (8 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

Foundations of Math 12 Record Chart

Name: **Commencement Date:**

Chapter	Topic	% on Test A	% on Test B	% on Cumulative Unit Test	Date
UNIT 1: FINANCIAL MATHEMATICS					
1	Finance: Investing Money				
2	Finance: Borrowing Money				
	Unit 1 Financial Mathematics Cumulative Test				
UNIT 2: COUNTING METHODS AND PROBABILITY					
4	Counting Methods				
5	Probability				
	Unit 2 Counting Methods & Probability Cumulative Test				
UNIT 3: SET THEORY AND POLYNOMIAL FUNCTIONS					
3	Set Theory and Logic				
6	Polynomial Functions				
	Unit 3 Exponential & Logarithmic Functions Cumulative Test				
UNIT 4: EXPONENTIAL, LOGARITHMIC AND SINUSOIDAL FUNCTIONS					
7	Exponent & Logarithmic Functions				
8	Sinusoidal Functions				
	Unit 4 Equations & Functions Cumulative Test				

Course Evaluation

Course Evaluation	Total Percent	Out of Percent	Calculated Percent	Value	Result

Chapter Tests (8)		**800**		**30%**	
Cumulative Unit Tests (4)		**400**		**70%**	
				Final Mark	

Unit 1: Financial Mathematics

Textbook: Foundation of Math 12 by Nelson

Chapter 1: Investing Money

Learning Outcomes:

- Understanding and comparing simple and compound interest
- Determining how changes in investment variables changes rate of return
- Comparing investment options and portfolios

Section 1.1: Simple Interest

Study the notes and examples on pages 6-12 and memorize the Summary on page 13.
View this YouTube video for a lesson on this section:
http://tinyurl.com/MEC-FOM12-1-1

Simple interest is the interest that an investment accumulates when the interest is calculated on the initial investment and added or paid to the investor after different periods of time. (this is not compound interest which you will learn about in the following sections)

- **Formula for determining simple interest:**
  - $I=Prt$
    - **I = simple interest earned**
    - **P = the principle or amount of the original investment (in dollars and cents)**
    - **r = the rate of the simple interest on the investment (in decimal form)**
    - **t = amount of time the investment is invested = the term (in years).**

Example: Gary invests $500 in a short-term GIC investment that earns 4% simple

interest for 3 years. How much interest will Gary earn from this investment?

Solution:

$I = \Pr t$

$I = (500)(0.04)(3)$

$I = \$60$

Gary will earn \$60 in interest on this investment**.**

Note: time must always be converted to years and does not take into consideration how often interest is paid. For example, if the investment was made for 15 months, you would divide by 12 months to convert to years $\left(t = \frac{15}{12}\, years\right)$. If the investment was for 235 days, you divide by 365 days to convert to years $\left(t = \frac{235}{365}\, years\right)$. If the question is in weeks, divide by 52 $\left(t = \frac{n}{52}\, years\right)$. Lastly, the frequency of interest payments only matters if interest is paid after the term that is calculated and so the investment must be left longer to get the correct interest earned; ie. If you calculate *n* to be 14 months but the interest is paid semi-annually, round up to 18 months to get the correct interest payment.

Example: How long should an investment of \$1000 earning 2.5% simple interest be invested for if the interest earned needs to be \$500 and the interest is paid annually.

Solution: Rewrite the formula to solve for *t.*

$I = P\ rt$

$\$500 = (\$1000)(0.025)t$

$t = \dfrac{500}{(1000)(0.025)}$

$t = 20$ years

20 years to earn \$500 in interest.

Future Value is the amount of the total investment and includes the initial principle plus the interest earned on the investment.

- **Formula for calculating future value:**
  - $A = P + \Pr t \quad \text{or} \quad A = P\ 1 + rt$

- **A = future value of simple interest investment**

Example: What is the future value of Gary's investment from the previous example?
Solution:

$$A = P + \Pr t$$
$$A = 1000 + (1000)(0.025)(20)$$
$$A = 1000 + 500$$
$$A = \$1500$$

The future value of Gary's investment is \$1500 dollars; this is \$500 in interest earned plus the original \$1000 investment.

Complete the following questions and check your answers with the solutions at the back of the text.

Section	Page	Practice Questions	Check When Done
1.1	14-17	1,3,5,8,10, 12	☐

FOM12: Chapter 5 - Probability Test B

Name: _____ **Date:** _____ **Total Mark =** _____**/ 26**

Multiple Choice = 12 Marks
Identify the choice that best completes the statement or answers the question.

1. The odds against Georgette passing her English assessment are 7:2. Determine the odds of her passing the assessment?
A. 7:2
B. 9:2
C. 2:9
D. 2:7

2. If Amir's odds for getting a point when shooting a free-throw in basketball are 8:3, what is the probability he will get a point?
A. $\frac{8}{3}$

B. $\frac{8}{11}$

C. $\frac{3}{8}$

D. $\frac{3}{11}$

3. The weather report states that there's a $\frac{1}{4}$ probability of rain tomorrow. What are the odds that it will rain?
A. 1:4
B. 3:5
C. 1:3
D. 4:1

4. An alarm company randomly generates PIN codes consisting of 5 digits. There are no restrictions on what the numbers can be. What is the probability that the code consists of all the same numbers?
A. 0.001
B. 0.0001
C. 0.00001
D. 0.000001

5. Denaris has two children. What is the probability that one is a girl and the other is a boy?

A. $\frac{3}{8}$

B. $\frac{1}{4}$

C. $\frac{3}{4}$

D. $\frac{1}{2}$

6. Select the events that are mutually exclusive.
A. Randomly selecting a sports car or a car with only two seats from an underground parking lot.
B. Drawing an ace or a spade from a standard deck of 52 playing cards.
C. Rolling a pair of six-sided dice and getting a sum of 7 or a double (both dice with same number)
D. Drawing an face card or a black card from a standard deck of 52 playing cards.

7. A bag contains 12 jelly beans, 10 toffees and 9 gum balls. What is the probability you randomly choose a jelly bean.

A. $\frac{12}{19}$

B. $\frac{1}{2}$

C. $\frac{12}{31}$

D. $\frac{22}{31}$

8. What is the probability of drawing a 4 or a King from a standard deck of 52 playing cards?
A. 0.0283

B. 0.25

C. 0.0385

D. 0.1538

9. Dhillon is drawing two cards from a deck of 52 playing cards. What is the probability he will get two aces.
A. 0.4%
B. 0.5%
C. 0.6%
D. 0.7%

10. Select the event that is dependent.
A. Selecting two candies from the candy box to take to school.
B. Rolling a pair of dice and getting a double (same number on both dice).
C. Drawing two cards from a deck of cards with replacement.
D. Landing on a red when spinning a 4-coloured spinner consisting of red, orange, pink, blue.

11. A committee must consist of one teacher, and two students chosen from two teachers and 30 students. What is the probability that Mr. Menka, Lori and Sharif fill these roles respectively?
A. 0.06%

B. 0.34%

C. 0.11%

D. 0.22%

12. Ivan goes to his lab 35% of the time and goes to his specimen room 45% of the time, and sometimes he does both when at work. He does neither of these things 30% of the time. What is the probability that he goes to both in one day?
A. 10%
B. 16%
C. 30%
D. 70%

Short Answer = 14 Marks
SHOW WORK

1. Sydney is playing hockey tonight. His odds scoring a goal are 2:7; however, the goalie's odds of stopping a goal are 7:1. Using the goalie's odds, what are the odds that Sydney scores?
(1 mark)

2. Gabbie and Raul want to win the top two spots of the spelling bee. What is the probability they will place in the top two in a group of 10 people?
(2 marks)

3. A box of Jelly beans contains 6 popcorn flavoured, 8 fruit flavoured, and 5 sour flavoured. What is the probability you will randomly select 3 sour flavoured jelly beans in a row?
(2 marks)

4. A council consisting of 12 people has decided to elect a group of 3 people to represent their city views at the next public town hall meeting. What is the probability Sharmain is on that committee?
(2 marks)

5. If all of the letters in the word TRIANGLE were permuted, what is the probability of having a word that starts with the letter A and ends with the letter G?
(3 marks)

6. Angelo is sometimes late for baseball games if the snooze button doesn't work on his alarm. The snooze button doesn't work 20% of the time. If the snooze works, he's late 10% of the time and if it doesn't work, he's late 90% of the time. What is the probability he will be one time for a game?
(4 marks)