Correct yesterday's Work (Changing Conditions)   pp. 450-452 #4, 6, 7, 11

Return and Correct SWYK (*Formative*) 8.1

Do Formative Quiz on following slide ?

~~Aready Done Fall 2017~~Return and Correct Ch 7 Summative~~

Copy Learning Goal and Begin Today's Work from slides

Be prepared for SWYK 8.2 on Tuesday!

Submit Dec. 11, Dec. 12 and Dec. 13 Homework

Date	Topic	Entertainment
Mon. Dec. 11	8.1 Simple and Compound Interest	Investigation + p. 428 #4a, 7
Tues. Dec. 12 (extra help at lunch)	8.2 Compound Interest	pp. 432-434 #2, 3, 6, 8, 12, 15
Wed. Dec. 13 (extra help at lunch)	8.3 Present Value	pp. 439-441 #2ab,4,6,7,9,10,13,16a **Study for SWYK8.1 Tomorrow**

6. Terry is confused about the various compounding periods offered by his bank. If he deposits $6000 into an investment account for one year at 5% per year, how much more interest will he earn by compounding

a) semi-annually instead of annually?

b) quarterly instead of annually?

c) monthly instead of annually?

$A = ?$ $A = ?$ $A = ?$ $A = ?$

$P = 6000$ $P = 6000$ $P = 6000$ $P = 6000$

$i = \dfrac{0.05}{1}$ $i = \dfrac{0.05}{2}$ $i = \dfrac{0.05}{4}$ $i = \dfrac{0.05}{12}$

$n = 1 \times 1$ $n = 1 \times 2$ $n = 1 \times 4$ $n = 1 \times 12$

$\quad = 1$ $\quad = 2$ $\quad = 4$ $\quad = 12$

$A = 6000\left(1 + \dfrac{0.05}{1}\right)^{1}$

$\quad = 6300$ $A = 6000\left(1 + \dfrac{0.05}{2}\right)^{2}$ $A = 6000\left(1 + \dfrac{0.05}{4}\right)^{4}$

$\quad\quad\quad = 6305.672$ $A = 6000\left(1 + \dfrac{0.05}{12}\right)^{12}$

$\quad\quad = 6303.75$ $\quad \doteq 6305.67$

$\quad\quad\quad\quad\quad \doteq 6306.971$

$\quad\quad\quad\quad \triangle \doteq 6305.67 - 6300$ $\doteq \$6306.97$

$\therefore more = \triangle$ $\quad \doteq \$5.67$

$\quad\quad = 6303.75 - 6300$ $\triangle = \$6306.97 - 6300$

$\quad\quad = \$3.75$ $\quad \doteq \$6.97$

Today's Learning Goal(s):

By the end of the class, I will be able to:

a) explain different ways to save and invest money.

Formative Quiz on Simple Interest, Compound Interest, & Present Value

You may need these formulas today:

Copy and complete the following 3 questions:

I=Prt $A=P(1+i)^n$

$A = P + I$

1. Determine the amount of, **AND** total interest earned on a $2150 investment at 4.8%/a, after 9 years simple interest.

$928.80, $3078.80

$I =$

$P = 2150$

$r = 0.048$

$t = 9$

$I = Prt$

$= 2150(0.048)(9)$

$= \$928.80$

$A = P + I$

$= 2150 + 928.80$

$= \$3078.80$

2. Determine the amount of, **AND** total interest earned on a $1600 investment of 5.2%/a, **compounded quarterly** for 6 years.

$2181.46, $581.46

$A = ?$

$P = 1600$

$i = \dfrac{0.052}{4}$

$n = 6 \times 4$

$\quad = 24$

$A = P(1+i)^n$

$= 1600\left(1 + \dfrac{0.052}{4}\right)^{24}$

$\doteq 2181.457$

$= \$2181.46$

$I = A - P$

$= 2181.46 - 1600$

$= \$581.46$

3. Karla borrowed some money at 8.7% per year, **compounded monthly**. After 3 years, she paid $4098.83 to pay off the loan. What sum of money did Karla borrow?

$3160.22

$A = 4098.83$

$P = ?$

$i = \dfrac{0.087}{12}$

$n = 3 \times 12$

$\quad = 36$

$A = P(1+i)^n$

$4098.83 = P\left(1 + \dfrac{0.087}{12}\right)^{36}$

$\dfrac{4098.83}{\left(1 + \dfrac{0.087}{12}\right)^{36}} = P$

$P \doteq 3160.224$

$\doteq \$3160.22$

MBF 3CI   Investment Alternatives

Personal Finance: Savings and Investment Alternatives (9.1 & 9.2)

Date: _Dec.15/17_

Basic Investment Terminology:

Investment: the use of money in hopes to make more money.
One who invests money is an **investor**.

Risk: The probability that an investment will lose its value.
Note: High risk investments usually have a higher interest rate than low risk
investments. (Do you know why?)

Term: The time between the issue date (starting date) and
the maturity date (closing date) of a loan or investment.

Registered Investment:
An investment registered with the federal (Canadian) government.
This allows for income tax payable to be deferred until a later date.

Portfolio: A collection of investments held by an individual, company or government.

Rule of 72: A formula that approximates how many years it will take to double your
money in an investment:

$$\frac{72}{\text{interest rate}} = \text{how many years it will take to double}$$

Note: In this formula do <u>**NOT**</u> change the interest rate % to a decimal.

1. Bank Accounts

Chequing Account: A bank account that is used for daily banking and money management. This includes paying bills, writing cheques, …The interest rate on the balance is very low.

Savings Account: A bank account that is used to build an amount of money that can be used at a later date. It often has the same features as a chequing account (paying bills, writing cheques, …). The interest rate on the balance is very low, but usually not as low as the one for a chequing account.

PROs	CONs
• Some bank accounts do **NOT** have user fees for using ATMs and purchases with debit cards • No risk	• Some have user fees for using ATMs and purchases with debit cards • Very low interest rate

What is a tax-free savings account? MORE ON THIS LATER…

TFSA

EXAMPLE 1

no fee bank account	President's Choice FINANCIAL

balance	Annual interest rate
$0.00 - $1,000.00	0.05
$1,000.01 - $5,000.00	0.10
$5,000.01 - $10,000.00	0.15
$10,000.01 - $25,000.00	0.25
$25,000.01 and up	0.50

Source: www.pcfinancial.ca

Note:
Rates are percentages

a) Using the table above, calculate the amount of interest ($) earned on a balance of $1500.00 for one year.

$1.50

$I = ?$
$P = 1500$
$r = 0.10\%$
$r = 0.001$
$t = 1$

$I = Prt$
$= 1500(0.001)(1)$
$= 1.50$

☐

b) Using the table above, calculate the amount of interest ($) earned on a balance of $1500.00 for one month.

$0.13

$I = ?$
$P = 1500$
$r = 0.1\%$
$= 0.001$
$t = \dfrac{1}{12}$

$I = Prt$
$= 1500(0.001)\left(\dfrac{1}{12}\right)$
$= 0.125$
$\doteq \$0.13$

☐

2. Guaranteed Investment Certificates (GICs)

An investment that pays a fixed amount of interest, for a fixed amount of money, for a fixed amount of time.

PROs	CONs
• No risk • Higher interest rate than savings and chequing accounts	• Money is "locked in" for a fixed amount of time • Penalty if cashed before maturity • Interest earned is taxable

EXAMPLE 2

Guaranteed Investment Certificate (GIC) (Long-Term & Compound Interest)[1]		
	1 year	0.40%
	2 years	1.30%
	3 years	1.60%
	4 years	1.70%
	5 years	1.90%

Source: http://www.tdcanadatrust.com

TD **Canada Trust**

Interest is compounded annually
⇐

Using the table above, calculate how much interest $ is earned on a $2000 GIC that has a maturity date of 3 years from today, if interest is compounded annually.

$97.54, ($2097.54)

$A = ?$

$P = 2000$

$i = \dfrac{0.016}{1}$

$n = 3 \times 1$
$\quad = 3$

$A = P(1+i)^n$

$= 2000(1+0.016)^3$

$\doteq 2097.544$

$\doteq \$2097.54$

$\therefore I = A - P$
$= 2097.54 - 2000$
$= \$97.54$

3. Stocks

A certificate that shows that you own a fraction of a corporation is a **stock**. The portion of the company you own is known as a **share**, which are traded on the **stock market**. You buy a share in a company, and sell it at a later date.

Company profits may be divided among **shareholders** in the form of **dividends**. Dividends are usually paid quarterly.

The largest Canadian stock market is the Toronto Stock Exchange (**TSX** or **TSE**). However, not all stocks are bought and sold there - some are bought and sold on the **NASDAQ** in New York, USA.

PROs	CONs
• If the stock value goes up, you make money • No penalty if you sell your share(s)	• Medium to high risk • If the stock value goes down, you lose money • Selecting stocks requires a lot of studying • You pay a special tax ("capital gains tax") when you sell the stock if it makes money • Fees paid to stock brokers

EXAMPLE 3

You bought 80 shares in "Graphing Calculators Inc." last month for $0.8564 each. The present value is $0.6745. If you sell them today how much money would you lose? What percentage loss would you experience?

a) $Difference = 0.8564 - 0.6745$

$$= 0.1819$$

$Value\ Lost = 80 \times 0.1819$

$$= 14.552$$

$$\doteq \$14.55$$

Value Lost =$14.55

👉 Percentage Lost = $\underline{\text{Difference in Value}}$ x 100%
                     Original Value

Percentage Loss =21.24%

$$= \frac{0.1819}{0.8564} \times 100\%$$

$$\doteq 21.24\%$$

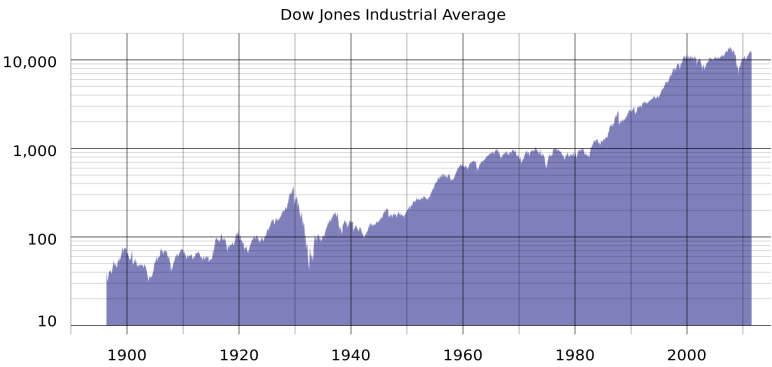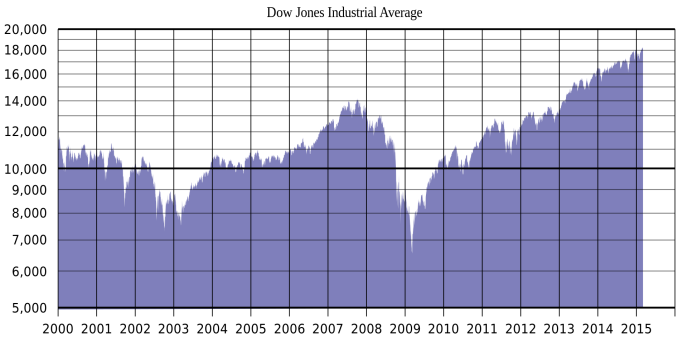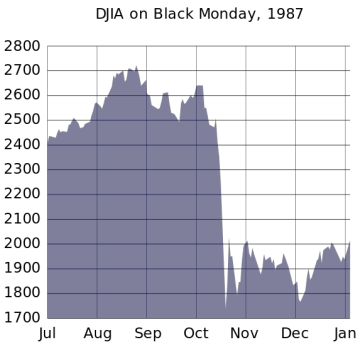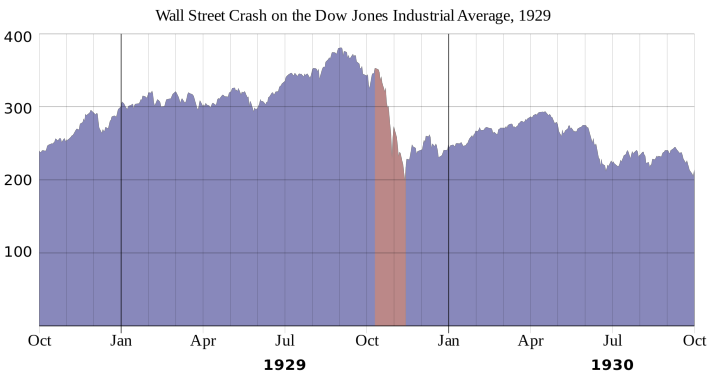Would you want to sell them now? Explain.

4. Bonds

An 'IOU' (debt) in which an investor agrees to loan money for a fixed period of time to a corporation or government in exchange for a fixed interest rate is a **bond**. Companies and governments issue bonds to help raise money.
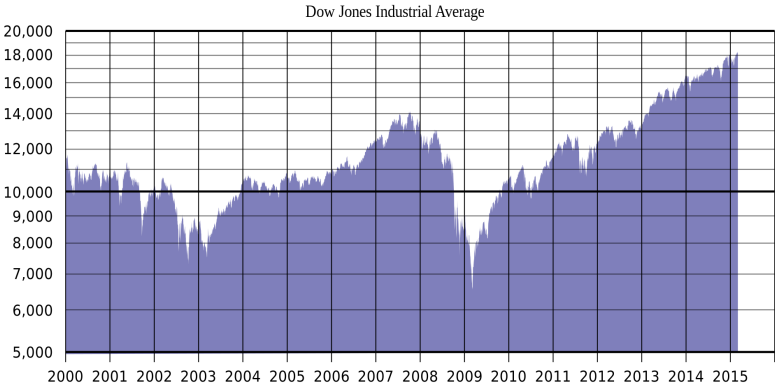
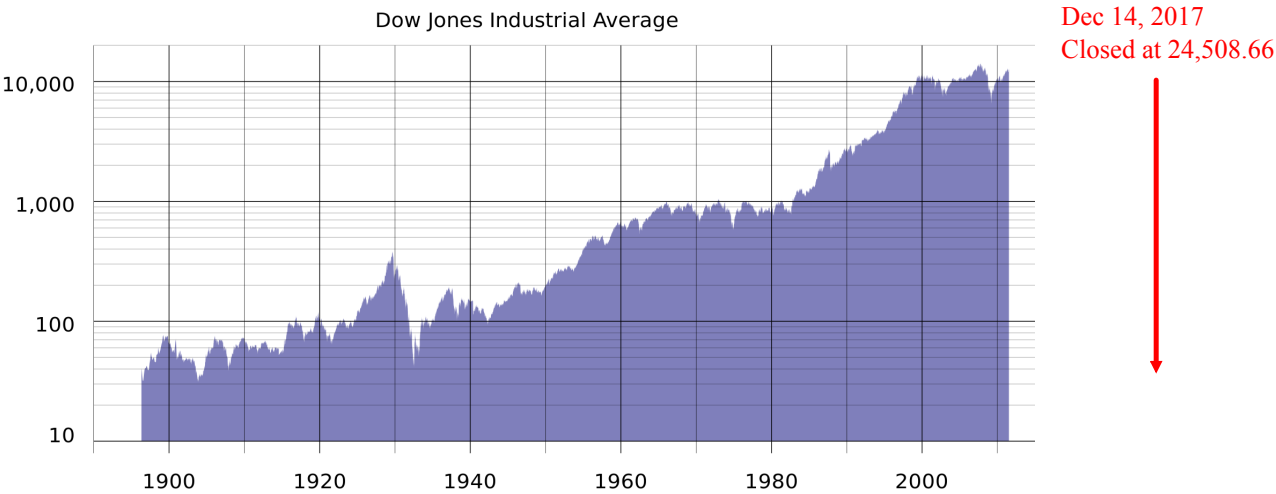| PROs	CONs
• No risk if it is a **Canada Savings Bond** or an **Ontario Savings Bond**	• Medium to high risk (only if it is a corporate bond) • You pay a special tax ("capital gains tax") when you sell the bond if it makes money

5. Mutual Funds

A **mutual fund** is a portfolio made up of stocks, bonds, and other investments. The mutual fund is usually **diversified**, which means that for every high risk investment, there are several low-risk ones. (Do you know why this reduces your risk?)

PROs	CONs
• Can be low risk • Portfolio is usually diversified	• Can be medium risk • Depending on the types of investments in the portfolio, there may be a penalty if cashed before maturity • Interest earned is taxable

Wall Street Crash on the Dow Jones Industrial Average, 1929

DJIA on Black Monday, 1987

Dow Jones Industrial Average

Dow Jones Industrial Average

Dow Jones Industrial Average

Dec 14, 2017
Closed at 24,508.66

Dow Jones Industrial Average

Dollar-Cost Averaging

$10 each month

share value	$1/share	$0.50/share	$1/share	$2/share
# of shares bought this month	10	20	10	5
Total # of shares	10	30	40	45
Total contributions	$10	$20	$30	$40
Value of ALL shares	$10	$15	$40	$90

6. Registered Retirement Savings Plans (RRSP)

An **RRSP** is a plan that helps individuals set aside money to be used after they retire. Payments to the plan are usually done monthly or bi-weekly.

PROs	CONs
- The more money you put into an RRSP each year, the less income tax you have to pay - Some employers "match" your RRSP payments - It's money for retirement!	- Penalty if cashed before maturity - Income tax is paid on it when money is withdrawn - Some employers **don't** "match" your RRSP payments

7. Registered Education Savings Plans (RESP)

An **RESP** is a plan designed to help an individual finance their child's post-secondary school education. Parents, grandparents, aunts and uncles or anyone else can help finance it too.

PROs	CONs
• When the child becomes a students, no tax is paid on the money when it is withdrawn, as long as it is for educational purposes • The federal government will add 20% on the first $2000 (annually) to a child under 18	

8. *Other*

A **tax-free savings account** is an account with a bank that can hold many investments, such as GICs, mutual funds, stocks and bonds, where you will not pay any tax on interest earned, as long as your investments do not total more than $5000.

Other investments include real estate, gold and silver (precious metals), artwork and antiques.

Do the Word Match Activity

REVIEW QUESTIONS

Show full solutions in your notebook for the following questions:

1. Using the table from **Ex. 1**:
   a) Calculate the amount of interest ($) earned on a balance of $200.00 for one year.
   b) Calculate the amount of interest ($) earned on a balance of $5000.02 for one year.

2. Approximately how long will it take $2500 to double if interest is 7% per year?
   (Hint: use the **Rule of 72**)

3. What interest rate will allow an investment to double in 3 years?
   (Hint: use the **Rule of 72**)

4. Using the table from **Ex. 2,** how much interest will you earn in a two-year GIC investment with a principal of $2000?

5. "Company HHSS" is listed at $1.36 (per share) on TSX. If you purchase 50 shares of this company, how much will this cost you (before brokerage fees)?

6. In the space provided, write the letter corresponding to the investment product the statement best represents:

A	Bonds
B	Mutual Funds
C	Stocks
D	Real estate
E	RRSP
F	Canada Savings Bond

i) _____ The safest investment guaranteed by the federal government.

ii) _____ The issuer agrees to pay investors a fixed interest rate for a fixed period of time.

iii) _____ A way to own a part of a company and share in its profits.

iv) _____ A collection of bonds, stocks, GICs, and other investments.

7. Jocelyn invested $1000 in a mutual fund exactly one year ago. Unfortunately, it s rate of return was -5.29% (it lost 5.29% of its value). Calculate the current value of her mutual fund.

8.   **TRUE** or **FALSE**?
a) _____   A GIC must be held for a set amount of time. If it's not, a
             penalty charge will apply.

b) _____   Compound interest is earned on an outstanding balance plus
             any previous interest earned.

c) _____   A mutual fund is always issued by a government.

d) _____   Stocks are a safer investment than GICs.

9. **Multiple Choice.** Choose the most correct answer

i) Out of all investment products below, which one generally earns the lowest
   interest rate?
   a) GIC
   b) savings account
   c) mutual fund
   d) Canada Savings Bond

ii) The total interest earned on a $100 investment for 2 years at 10% per year
    compounded annually would be:
    a) $2
    b) $21
    c) $11
    d) $10

iii) Based on the **Rule of 72**, money earning 6% per year would take how many
     years to double?
     a) 6
     b) 8
     c) 9
     d) 12

iv) An example of a company's debt is a:
    a) corporate bond
    b) share of stock
    c) mutual fund
    d) municipal government bond

v) Out of all products listed below, the one with likely the most risk is a:
   a) chequing account
   b) corporate stock
   c) government bond
   d) GIC

FINAL ANSWERS
1a) 10 cents   b) $7.50   2) About 10.3 years   3) 24%   4) $52.34   5) $68
6) i) F   ii) A   iii) C iv) B
7) $947.10
8 a) TRUE   b) TRUE   c) FALSE   d) FALSE
9 i) b   ii) b   iii) d   iv) a   v) b