

Grade 11 College Math**Day: Lesson 6 - 3****Unit: Personal Finance****Topic: Investment
Alternatives****✚ homework check: Lesson 6 - 2****✚ note: Investment Alternatives**

Mutual funds, GICs, RESPs, and RRSPs are types of investments where money is used to buy stocks and other assets. Some of these funds are managed by investment companies who charge a fee to manage the portfolio while GICs are funds guaranteed to produce the effects advertised if the money is invested for a certain amount of time.

Risky investments have been known to decrease in value under certain circumstances. A decrease in value is reflected by subtracting the interest rate per compounding period rather than adding. With greater risk, there is a potential for greater return or greater loss.

For example,

- a) A mutual fund usually has a return of 7.5% annually, with an administration fee of about 2.3%. What is the value of an investment of \$10 000 after 8 years?

$$7.5\% - 2.3\% = 5.2\% \text{ annual interest rate}$$

$$5.2\% = 0.052$$

$$n = 8(1) = 8$$

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

$$A = 10000(1+0.052)^8$$

$$A = \$15001.20$$

- b) During the depression, the number of investments decreased, yet people still invested their money in hopes of making money. Chloe's decrease averaged 2.5% compounded monthly with a monthly administration fee of 0.9%. What did she invest to end up with only \$2500 after 3 years?

$$0.9\% = 0.009$$

$$2.5\% = 0.025$$

$$\frac{0.025}{12} = 0.0020833$$

$$-0.0020833 - 0.009 = -0.0110833$$

$$P = A(1+i)^{-n}$$

$$P = 2500(1 - 0.0110833)^{-36}$$

$$P = \$3734.10$$

✚ *homework assignment:* Lesson 6 - 3

Lesson 6 – 3:**1. Complete the table. (6 marks)**

| r (%) | Compounding frequency | i |
|---------|-----------------------|--------|
| 9.0 | Monthly | |
| | Quarterly | 0.04 |
| -4.6 | Semi-annually | |
| 1.8 | | 0.0045 |
| 0.5 | Monthly | |
| 12.8 | | 0.032 |

2. Use the compound interest formula to determine the FV of each three-year investment. Assume that each investment is compounded annually and has a 2% management fee. (6 marks)

a) \$1000 averaging 6.08% growth per year

b) \$5000 that averages 18.42% growth per year

c) \$2000 that averages 2.27% growth per year

3. Calculate the 2% management fee for each of the above. (6 marks)

a)

b)

c)

- 4. One year ago, Joseph invested \$2500 in a mutual fund that decreased in value by 4.92%. The fund also has a 1.5% management fee. Determine the value of Joseph's investment today. (3 marks)**
- 5. Meghan puts \$2000 in each year into a no fee investment that pays 3.8% per year, compounded monthly. Determine the value of Meghan's investment after 5 years. (3 marks)**
- 6. Hailey invested \$3500 into a mutual fund that increased in value 1.92% in the first year, 2.5% in the second year, and 2.7% in the third year. If there was an overall management fee of 2.4%, what is the value of Hailey's investment. (3 marks)**
- 7. Joanna bought an \$800 GIC with a variable rate. In the first year, the GIC pays 3.85% annual interest. In the second year, the GIC pays 4.05% annual interest. In the third year, the GIC pays 4.2% annual interest. All interests are compounded monthly. Calculate the value of the GIC at the end of the three years. (5 marks)**
- 8. Eric invests one quarter of his pay from his job. He earns \$150 each week. If his investment pays 7.2% annually, how much money does Eric save in 2 years? (4 marks)**