# Math 220 - Calculus f. Business and Management - Worksheet 7

## *Worksheet 7 - he number $e$ and one-time investments*

### *Periodic Compounding*

***Exercise 1a:*** *Chen has received* $\$5,000$ *as a gift from his grandfather. He puts the money in the bank where an annual interest rate of* $1.25\%$ *is compounded monthly. How much will his investment be worth at the end of* $6$ *years?*

*Exercise 1b: Helen is saving to buy a car. Her bank is offering Certificates of Deposit (CDs) that pay a rate of* $2.75\%$ *compounded semi-annually if the money is left for* $5$ *years. How much must Helen spend on CDs in order to have* $\$8,500$ *at the end of that time?*

*Exercise 1c: Laquisha needs* $\$40,000$ *as a down payment for a house. She plans to put* $\$35,000$ *in a savings account that pays an annual interest rate of* $1.75\%$ *quarterly. How long must she leave the money in order to reach her goal?*

### *Continuous Compounding*

*Exercise 2a: Chen has received a gift from his grandfather in height of* $\$5,000$*. He puts it in the bank where an annual interest rate of* $1.25\%$ *is compounded continuously. How much will his investment be worth at the end of* $6$ *years?*

*Exercise 2b: Helen is saving to buy a car. Her bank is offering Certificates of Deposit (CDs) that pay a rate of* $2.75\%$ *compounded continuously if the money is left for* $5$ *years. How much must Helen spend on CDs in order to have* $\$8,500$ *at the end of that time?*

*Exercise 2c: Laquisha needs* $\$40,000$ *as a down payment for a house. She plans to put* $\$35,000$ *in a savings account that pays an annual interest rate of* $1.75\%$ *compounded continuously. How long must she leave the money in order to reach her goal?*

### *Effective Interest Rate*

*Exercise 3: Find the effective interest rate for each of the three problems in the two sections above on periodic and continuous compounding.*

### *Random Word Problems*

*Exercise D1: What is the effective interest rate for an investment that pays* $6\%$ *per year compounded weekly (*$52$ *weeks/year)?*

*Exercise D2: How much will an investment of* $\$1,250$ *be worth if it is invested for* $7$ *years at* $8\%$ *compounded continuously?*

*Exercise D3: How long will it take for an investment of* $\$500$ *at* $2.5\%$ *compounded monthly to be worth* $\$575$*?*

*Exercise D4: How much must be invested for four years at* $4.5\%$ *compounded quarterly to be worth* $\$625$ *at the end of that time?*

*Exercise D5: What is the effective interest rate for an investment that pays* $3.5\%$ *per year compounded continuously?*

*Exercise D6: How much must be invested for ten years at* $2.5\%$ *compounded continuously to be worth* $\$12,500$ *at the end of that time?*

*Exercise D7: How much will an investment of* $\$1,250$ *be worth if it is invested for* $7$ *years at* $8\%$ *compounded semi-annually?*

*Exercise D8: How long will it take for an investment of* $\$8,500$ *at* $2.25\%$ *compounded continuously to be worth* $\$9,500$*?*