Please note that while this week-in-review contains some review for Exam 3, it is **not** comprehensive. Use review worksheets on eCampus and past week-in-reviews for more practice.

Work-out Problems

Study tip : Show all your work !

Exercise 1. Congratulations ! You just graduated high school ! Your rich aunt has given you a high school graduation gift of \$700,000. The gift, however, is in the form of a 37-year bond with an annual interest rate of 2.5% compounded annually. The bond will be worth \$700,000 in 37 years. What is this gift worth at the present time ? (Round to the nearest cent.)

Exercise 2. You are now officially an Aggie ! You're going to work hard for the next 4 years, and already plan to celebrate your graduation from Texas A&M University by going on a vacation backpacking in Europe. You put \$200 in your account today, and decide to set aside \$150 at the end of each month for the trip. If you started depositing the money when you were a freshman at the end of each month into a savings account paying interest at the rate of 8% per year, compounded monthly, how much money will be in your travel fund at the end of the 4th year when you graduate ? (Round to the nearest cent.)

Exercise 3. Whoop ! You just graduated, went on your backpacking trip to Europe, and are now hired at a firm working as a business consultant ! With all the financial skills you learned in Math 140 you know that you should already start saving up for retirement. You wish to accumulate a retirement fund of \$550,000. How much should you deposit each month into your retirement account, if the account pays interest at a rate of 5.5%/year compounded monthly, and if you want to retire in 40 years ? (Round to the nearest cent.)

Exercise 4. You plan to purchase your first home ! You need to take out a mortgage loan for \$150,000. Your finance company has offered you two options :

— Option A : A fixed-rate mortgage at an interest rate of 6.5% per year compounded monthly, payable over a 30-year period in 360 equal monthly installments.

— Option B : A fixed-rate mortgage at an interest rate of 6.25% per year compounded monthly, payable over a 12-year period in 144 equal monthly installments.

How much interest would you save if you choose the 12-year mortgage instead of the 30-year mortgage ?

Exercise 5. Suppose I have \$5000 dollars of credit card debt accruing interest at a rate of 27% per year compounded monthly. What will my outstanding debt be after 3 years if at the end of each month if I pay \$150 to the credit card company ?

Exercise 6. Skye wishes to purchase a \$360,000 house. She will make a down payment of 14% of the purchase price, and take out a mortgage loan on the remaining balance. The mortgage is to be amortized through monthly payments for a term of 30 years, with an interest rate of 3%/year compounded monthly on the unpaid balance.

1. What monthly payment will Skye be required to make ? (Round to the nearest cent.)
2. Skye plans to sell her house in 10 years. How much equity will Skye have in her house at this time ? (Round to the nearest dollar.)

Exercise 7. Alexa purchased a new home for \$230,000 and financed the purchase price at 5.25% annual interest compounded monthly for 30 years. The bank figured that Alexa's monthly payment is \$1,270.07. How much of Alexa's first payment will go toward interest and how much will go toward the current principal ?

Exercise 8. If you deposit \$10,000 into an account that compounds interest quarterly for 40 years, you will have a balance of \$211,307.65. What is the interest rate for this investment ? If you have a chance to put the same deposit in a continuously compounded account at the same interest rate, how much faster will you get to a balance of \$211,307.65 ? Round your **final** answers to one decimal place.

Multiple Choice Problems

Study tip : Write out all your work when you complete the multiple-choice problems.

Multiple Choice 1. A bank advertises a nominal rate of 8.2% compounded daily. What is the annual percentage yield ? (Round your answer to 3 decimal places.)

(a) There is not enough information to determine the annual percentage yield.
(b) 0.085%
(c) 8.203%
(d) 8.515%
(e) 8.545%

Multiple Choice 2. What is the domain of $g(x) = \dfrac{\ln(x-2)}{e^{x-3}}$?

(a) $(-\infty, \infty)$
(b) $(-\infty, 2) \cup (2, 3) \cup (3, \infty)$
(c) $[2, \infty)$
(d) $(2, \infty)$
(e) $(2, 3) \cup (3, \infty)$

Multiple Choice 3. Lauren found an ordinary annuity that pays 4.5% annual interest compounded monthly. If she deposits \$100.00 each month into this annuity for the next twenty-five years, how much interest will she have earned?

(a) \$2615.80
(b) \$25,607.18
(c) \$25,299.80
(d) \$55,299.80
(e) \$30,000

Multiple Choice 4. The United States paid about 4 cents an acre for the Louisiana Purchase in 1803. Suppose the value of this property grew at an annual rate of 5.5% compounded annually. What was an acre of land worth 200 years later, in 2003? (Round to the nearest cent.)

(a) None of these
(b) \$178875.94
(c) \$2.56
(d) \$1788.76
(e) \$1.50

Multiple Choice 5. Find the accumulated amount at the end of 11 months on a \$1200 bank deposit paying simple interest at a rate of 6%/year. (Round your answer to the nearest cent.)

(a) \$1266.00
(b) \$1206.55
(c) \$80400.00
(d) \$7800.00
(e) None of these

Multiple Choice 6. Suppose I have an account with the amount \$1325 at the beginning of January 2018. If at the end of December 2019, it has the amount \$1523, what rate of interest was earned, to two decimal places (assuming simple interest and no other deposits or withdrawals in this time period)?

(a) 1.14%
(b) 1.75%
(c) 7.21%
(d) 7.47%
(e) 14.94%

Multiple Choice 7. Which of the following is equivalent to $\dfrac{f(x+h)-f(x)}{h}$ if $f(x)=\sqrt{x-5}$?

(a) $\dfrac{5}{\sqrt{x+h-5}-\sqrt{x-5}}$
(b) $\dfrac{1}{\sqrt{x+h-5}+\sqrt{x-5}}$
(c) $\dfrac{1}{\sqrt{x+h-5}-\sqrt{x-5}}$
(d) $\dfrac{h-10}{h(\sqrt{x+h-5}-\sqrt{x-5})}$
(e) None of these

Multiple Choice 8. Find the product of the solutions of

$$2e^{4-x^2}=3$$

(a) $\sqrt{\frac{5}{2}}$
(b) $\ln\left[\left(\frac{2}{3}\right)^4\right]$
(c) $4-\ln\frac{3}{2}$
(d) $4\ln 3-4\ln 2$
(e) $-4+\ln 3-\ln 2$

Multiple Choice 9. Suppose the demand equation for a particular product is given by $x=12000-1000p$, where x is the number of units sold and p is the unit price in dollars. Find the company's **maximum revenue**.

(a) \$48000
(b) \$36000
(c) \$24000
(d) \$12000
(e) \$6000

Multiple Choice 10. Find the domain of the following function

$$f(x)=\frac{\sqrt{x+1}}{(x^2-9)\sqrt[5]{60+12x}}\ .$$

(a) $(-\infty,-5)\cup(-3,3)\cup(3,\infty)$
(b) $(-5,-3)\cup(3,\infty)$
(c) $(9,\infty)$
(d) $[-1,3)\cup(3,\infty)$
(e) $(-1,3)\cup(3,\infty)$