Name: _____

MA111
Ch. 10 Exam Review
2011-09-26

Instructions: No books or notes may be used on this exam. You will have 50 minutes to answer all of the following questions. Additional paper is available if necessary. Please write legibly and keep your paper as organized as possible. Show all of your work! Answers without work or explanation will not receive full credit. Please use complete sentences where appropriate to explain your responses. Each part is worth 25% of the exam.

Part I: Matching

_____ Simple interest formula

_____ Compound interest formula

_____ Installment loan formula

_____ Fixed deferred annuity formula

_____ Future value of \$100 after one period of 10% and three periods of 20% interest

_____ Present value of three monthly payments of \$100 at 10% monthly interest

_____ Future value of three monthly payments of \$100 at 10% monthly interest

_____ Present value of 30 years worth of monthly payments of \$100 at 10% monthly interest

(1) $F = P(1+pT)$, F is future value, P is present value, p is periodic interest rate, T is number of periods

(2) $F = P(1+p)^T$, F is future value, P is present value, p is periodic interest rate, T is number of periods

(3) $P = Mq\frac{1-q^T}{1-q}$, P is present value, M is periodic payment, p is periodic interest rate, T is number of periods, $q = 1/(1+p)$ helps discount future payments into the present

(4) $F = M\frac{(1+p)^T-1}{p}$, F is future value, M is periodic payment, p is periodic interest rate, T is number of periods

(5) $\$100(1.1)(1.2)^3$

(6) $\$100/(1.1) + \$100/(1.1)^2 + \$100/(1.1)^3$

(7) $\$100(1.1)^2 + \$100(1.1) + \$100$

(8) $\$100(1/1.1)\frac{1-(1/1.1)^{360}}{1-(1/1.1)}$

Part II: Simple interest

1. Hermes's grandmother wants him to be able to afford his college textbooks in 2021, and so gave him a 10 year savings bond today. Its present value is \$100 and it earns 2% simple interest annually. How much will it be worth 10 years from now?

2. My Kentucky Utilities bill was \$121.19, but if it was 3 days late then it would be \$127.25.
(a) If we consider this a 3 day simple interest loan, what is the APR? Assume a 360 day year.

I believe KU is doing this.

(b) How much interest would you pay on a one year simple interest loan of \$121.19 at this APR?

(c) My understanding is that Kentucky law forbids such short loans (minimum term is a fortnight), so let's pretend KU intended a 1 month simple interest loan and calculate the APR:

Part III: Compound interest

1. You invest $100 at 1.20% APR compounded monthly. How much is the investment worth after 1 year?

2. You invest $100 a monthly compounded account with a (slowly) changing interest rate. The first six months, the rate is 1.20% APR; the next six months the rate is 1.80% APR; the next six months it is back to 1.20%; the next six months it is down to 0.90% APR. How much is it worth at the end of the two years?

Part IV: Installment loans

1. You want to finance the purchase of big screen TV. It costs $805, so you put it on a credit card with 36% APR. You find some crazy online thing that says you should pay $148.60 each month.

(a) What do you owe after the first month (with interest and then payment)?

(b) How many months does it take to pay it off?

Depending on rounding, you may need to pay an extra cent the last month.

(c) How much total interest did you pay?

2. The credit card seems expensive, so you consider using rent-to-own for 18 monthly payments of $65 to get the (exact same) TV. Which has the higher APR: the credit card or the rent-to-own? Clearly indicate your reasoning.

Bonus: each digit of accuracy on the rent-to-own APR is worth 2 points, up to 8 points total.

3. If you just pay cash, you pay $0 in interest. Which of these three options (credit card, rent-to-own, or cash) is the better deal and why? Make sure to give a complete answer; show that you understand the chapter.