

Math 106

Name ANSWER KEY

Turn-in Homework #2

Due Thursday February 5, 2009 at the beginning of class

Show all work neatly. Points will be deducted for messy, hard-to-follow, or incomplete work.

- 3 1. Aretha borrowed \$1350 from her parents and promised to pay back \$1475 in 15 months. What simple interest rate did she pay? 7.41%

2 approaches: A. Calculate interest amt. $1475 - 1350 = 125$
 B. Use $I = P \cdot r \cdot t$, so $125 = 1350 \cdot r \cdot \frac{15}{12}$, so $r = \frac{125}{1350 \cdot 1.25} = .07407 \dots \sim 7.41\%$
 OR B: use $A = P(1+rt)$
 $1475 = 1350(1+r \cdot \frac{15}{12})$
 and solve for r.
 $r = 7.41\%$

- 7 2. Steve has \$2500 that he would like to invest for a period of 6 years. Which of the following will be the best investment over the 6 year period? b) 2.69% comp. daily
 (Use the future value formulas to answer this question, and show the amount he would have at the end of 6 years under each scenario.)

a) Investing at 2.7%, compounded semiannually? \$2936.47
 $2500(1 + \frac{.027}{2})^{2 \cdot 6} = 2936.466 \uparrow$
 b) Investing at 2.69%, compounded daily (assume a 365-day year)? \$2937.87
 $2500(1 + \frac{.0269}{365})^{365 \cdot 6} = 2937.869 \uparrow$
 c) Investing at 2.685%, compounded continuously? \$2937.01
 $2500 \cdot e^{.02685 \cdot 6} = 2937.006 \uparrow$

3. Using the formulas for **Effective Annual Yield**, compare the effective annual yield of each of the three investments above. You will need to compute these percentages to three decimal places.

a) Investing at 2.7%, compounded semiannually? 2.718% $(1 + \frac{.027}{2})^2 - 1 = 1.027187 - 1 = .02718$
 b) Investing at 2.69%, compounded daily (assume a 365-day year)? 2.726%
 $(1 + \frac{.0269}{365})^{365} - 1 = 1.027264 - 1 = .02726$
 c) Investing at 2.685%, compounded continuously? 2.721%
 $e^{.02685} - 1 = 1.027213 - 1 \sim .02721$
 d) Does your answer change as to which is the best investment? Explain briefly.

No change - 2.69% compounded daily is the highest EAY, and the best return in problem 2. (2.685% compounded continuously is 2nd highest EAY and 2nd highest return.)

- 5 4. Barbara's uncle and aunt want to help her with college expenses, and to that end they want to be able to give her \$8000 in 3 years. They have a choice of two investments, one paying 3.45% compounded quarterly and one paying 3.44% compounded monthly. How much money would they need to deposit now in order to have \$8000 in 3 years with each of the investments?

a) 3.45% compounded quarterly 7216.62
 $P = \frac{8000}{(1 + \frac{.0345}{4})^{4 \cdot 3}} = 7216.610 \uparrow$ (always round up)
 b) 3.44% compounded monthly 7216.64
 $P = \frac{8000}{(1 + \frac{.0344}{12})^{12 \cdot 3}} = 7216.637 \uparrow$

- c) Which investment should they choose? The first, 3.45% compounded quarterly (very slightly better).

22 pts.