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Please use lots of space and explain your answers, showing clearly any work you had to do. Each question is worth 3 points.

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### Section 5.2 Compound interest

**(1)** If an annual interest rate of $5\%$ is compounded quarterly, what is the periodic interest rate?

**(2)** Suppose $3500 earns 6% annual interest, compounded monthly for 10 years.

    **(a)** Compute the periodic rate $i$

    **(b)** Compute the total number of periods $n$

    **(c)** Use $FV = P(1+i)^n$ to show that the value at the end is nearly double.

**(3)** Find the future value of $5000 at $4\%$ annual interest for 30 years with

    **(a)** Simple interest.

    **(b)** Interest compounded every year.

    (You should get a bit over $10\,000$ for (a) and a little over $15\,000$ for (b))

**(4)** How much money should be invested in a savings account now if it is to be worth $10\,000$ in 8 years? The account earns $4\frac{1}{4}\%$ interest compounded weekly.

    (Hint: explain why we need to solve $10\,000 = P(1+0.0425/52)^{416}$.)

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### Section 5.3 Annuities

**(5)** Jose makes monthly payments of $200 to an annuity earning 6% interest for 10 years.

    **(a)** What is the annuity worth at the end?

    **(b)** Give Jose's total contribution.

    **(c)** Find the total interest.

    (Hint: for part (a) use $FV = pymt((1+i)^n - 1)/i$ and you should get an answer close to $30\,000$.)

**(6)** Daniela has $30 taken from her weekly pay and put into an annuity that earns $7.2\%$ interest. When she retires in 25 years, how much is the annuity worth?

**(7)** Find the monthly payments to an annuity earning 4% interest for 10 years so that it is worth $50\,000$ at the end.

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If you get stuck on a question or aren't sure if you understand it:

- Go over the relevant class notes and section in the textbook.

- Check if you get the right answer for a similar odd-numbered question in the textbook (answers at the back of the book).

- Ask me about it after class.

- Come to my office hours: Mon 11:30 - 12:30, Wed 11:30 - 12:30 in CP 317.

- Go to the Math Tutorial Lab in-person in CP 303 or online.