$$F = P(1+rt) \quad F = P\left(1 + \tfrac{r}{n}\right)^{nt} \quad F = D\frac{\left(1+\tfrac{r}{n}\right)^{nt} - 1}{\tfrac{r}{n}} \quad P = R\frac{1 - \left(1+\tfrac{r}{n}\right)^{-nt}}{\tfrac{r}{n}} \quad APY = \left(1 + \tfrac{r}{n}\right)^n - 1$$

1. (8pts) Solve the following equations. Round the answer to 8 decimal places.

$3^x = 45$ $\hspace{15em}$ $(1 + x)^5 = 2.4$

2. (4pts) What is the future value of $1000 deposited for 18 months in an account bearing simple interest of 13%?

3. (6pts) A man borrows $200 from a pawn shop that he repays with $260 after 3 months. What simple annual interest rate has he been charged?

4. (6pts) What is the future value, after 5 years, of $2000 deposited into an account bearing 7% interest compounded daily?

5. (8pts) Jennifer wishes to save $20,000 for a down payment on a house. She can get a savings account bearing 4% compounded quarterly.
a) How much should she deposit at the end of every quarter in order to have $20,000 after 4 years?
b) Using your answer from a) (instead of the formula), how much should she deposit quarterly under the same terms if she wishes to have $30,000 after 4 years?

6. (10pts) The Bullynator was whacked so hard in the last exam that he landed in this one. Having fallen less than safely, he also incurred a $25,000 emergency room bill, for which he got a 10-year loan from his bank at 6% interest, compounded monthly.
a) What is his monthly payment?
b) What is the balance on the loan after 4 years?

7. (8pts) Suppose you can deposit $100 every month into an account bearing 9% interest compounded monthly. How long will it take you to save $5,000?

Bonus. (5pts) Bank of Shanghai is offering a savings account bearing 4.2% compounded monthly. Competing Bank of Beijing is offering a savings account bearing 4.1% compounded hourly. What is the better deal? (Hint: consider a deposit for 1 year).