Section F.1: Compound Interest

- Simple interest
  - interest is computed on the original principal only
  - \( I = Prt \)
  - \( A = P(1+rt) \)
- Discount loans
  - discount: \( D = Mrt \)
  - proceeds: \( P = M-D = M(1-rt) \)
- Effective rate of a discount loan
  - \( r_{eff} = \frac{D}{Pt} = \frac{r}{1 - rt} \)

1. Find the interest on a $600 investment made for 2 years at a simple interest rate of 8% per year. What is the accumulated amount?

2. How long will it take an investment to grow from $500 to $750 if the investment earns a simple interest rate of 8% per year?

3. Determine the annual simple interest rate at which $1500 will grow to $1580 in 7 months.

4. Jake has agreed to pay back a $5,000 discount loan at the end of 9 months. The loan has an annual simple discount rate of 6%.
   (a) What is the discount on this loan?
   (b) How much money does Jake actually receive from the loan?

5. Bob needs $750 for his cellphone bill. He has taken out a discount loan so that he will have the money to pay off this bill. The loan has an annual discount rate of 9% and has to be paid off in 5 months. What is the maturity value of this loan?
6. What is the effective rate on a discount loan that has an annual discount rate of 12% and the loan is to be paid off in 8 months?

Section F.2: Compound Interest

- interest is earned on the principal and on the interest
- \( A = P \left(1 + \frac{r}{m}\right)^{mt} \)
- Effective interest rate
  - \( r_{\text{eff}} = 100 \left(1 + \frac{r}{m}\right)^m - 100 \)
  - calculator command: Eff(r,m)
- present value
- compound interest problems may be solved using the TVM Solver on the calculator.

7. One bank, A, advertises a nominal rate of 7.15% per year compounded semi-annually. A second bank, B, advertises a nominal rate of 7% per year compounded daily. What are the effective yields for each bank? Which bank has the best interest rate?

8. \$3000 is invested at a rate of 8% per year compounded quarterly. What is the balance in the account at the end of six years?

9. Bob deposits \$5000 into an account that pays 5.96% per year, compounded monthly. How much money will Bob have at the end of 4 months? How much interest did Bob earn?
10. You want to take a trip in 3 years that will cost $18,000. How much should you deposit now into an account that earns 8% per year compounded daily so you will have enough for the trip.

11. You put $2,000 into an account and 5 years later had $8,450.50. If the account earned interest compounded monthly, what was the interest rate?

12. What interest rate would you get if you invest $600 and three years later you have $975 if the account is paid interest compounded quarterly?