

## Problem Set 36: Compound Interest

Calculate the final amount (accumulated value) in each case:

- \$7,000 invested for 8 years at 9% per annum compounded annually.
- \$6,350 invested for 11 ½ years at 8% per annum compounded semi-annually.
- \$9,000 invested for 7 years at 10% per annum compounded quarterly.
- \$15,000 invested for 15 years at 12% per annum compounded monthly.
- \$10,000 invested for 8 years at 9% per annum compounded weekly.
- \$14,000 invested for 50 years at 4 ¾% per annum compounded daily.
- \$14 million invested for 1 month at 4% per annum compounded monthly.
- \$1 million for 1 month @ 4%/a c. m.

**Answers:**  
 a) \$13,947.94    b) \$15,650.94    c) \$17,968.46    d) \$89,937.03    e) \$20,531.55    f) \$150,490.93  
 g) \$14,046,666.67    h) \$1,003,333.33

## Problem Set 37: Present Value

- Mrs. Fangrad borrowed \$9,500 for 3 years at 11.6% per annum, compounded quarterly.
  - How much money did she owe at the end of 3 years?
  - How much interest did she pay for the loan?
- What is the Present Value of each amount?
  - \$9,000 in 5 years, invested at 11% per annum, compounded semi-annually.
  - \$50,000 in 9 months, invested at 11% per annum, compounded quarterly.
  - \$100,000 in 3 years, invested at 3% per annum, compounded monthly.
  - \$78,840 in 9 years, invested at 4.8% per annum, compounded annually.
  - \$250,000 in a year, invested at 8.75% per annum, compounded quarterly.
- Sue wants to provide for her niece's education. How much should she invest on the day her niece is born to have \$22,000 on her 18<sup>th</sup> birthday, if the money earns 7% per annum, compounded quarterly?
- Samantha wants to have \$40,000 available for a down payment on a house in 10 years. How much should she invest now at 6 ¼% per annum, compounded semi-annually?

**Answers:**  
 1 a) \$13,387.77    b) \$3,887.77    2 a) \$5,268.88    b) \$46,091.89    c) \$91,403.38    d) \$51,700.54  
 e) \$229,270.89    3. \$22,000    4. \$21,616.27

## Problem Set 38: Rates

- \$4,000 doubles in 5 years. Calculate the annual rate of interest, compounded annually.
- \$5,500 is invested for  $7\frac{1}{2}$  years and accumulates to \$11,434.10. Calculate the annual rate of interest compounded semi-annually.
- \$7,000 is tripled in 11 years. Calculate the annual rate of interest, compounded quarterly.
- \$3,850 is invested for 12 years and accumulates to \$14,325.77. Calculate the annual rate of interest compounded monthly.
- \$1 million is invested for 20 years and accumulates to \$5 million. Calculate the annual rate of interest compounded weekly.
- \$5 is invested for 100 years and accumulates to \$20,000. Calculate the annual rate of interest compounded daily.
- \$5,000 is invested for 9 years at  $8\frac{1}{2}\%$  per annum compounded daily. If an investment of \$4,000 yields the same accumulated value in 8 years, calculate the annual interest rate compounded annually.

**Answers:**  
1. 14.9%   2. 10.0%   3. 10.1%   4. 11.0%   5. 8.1%   6. 8.3%   7. 13.1%

## Problem Set 39: Rates

- How long will it take for \$3,000 to accumulate to \$7,000 at each rate?
  - 7% per annum compounded annually
  - 9% per annum compounded semi-annually
  - 8% per annum compounded quarterly
  - 9% per annum compounded monthly
  - $7\frac{3}{4}\%$  per annum compounded minutely
- How long will it take for \$2,700 to triple at 8% per annum compounded daily?
- At what annual rate compounded semi-annually will \$2,700 triple twice as fast as in #2?
- At a certain rate of simple interest and a given amount of time, \$500 will accumulate to \$750. Calculate the accumulated value if \$500 is invested at twice the rate of simple interest and three times as long.

**Answers:**  
1 a) 12.52a or 12a27w   b) 9.62a or 9a226d   c) 10.697a or 10a255d   d) 9.450a or 9a164d   e) 10.933a or 10a11m  
2. 13.734a or 13a38w   3. 16.7%   4. \$2,000