**WS 802 Name:**

**Suppose you deposited $1 in the bank for 1 year at 100% interest…**

 round each final amount to 6 decimal places

|  |  |  |
| --- | --- | --- |
| **n (number of times compounded)** | **A = P(1 + r / n)nt** | **Final Amount** |
| 1 🡪 yearly |  |  |
| 12 🡪 monthly |  |  |
| 52 🡪 weekly |  |  |
| 365 🡪 daily |  |  |
| 8760 🡪 hourly |  |  |
| 525600 🡪 every minute |  |  |
| 31536000🡪 every second |  |  |

**Continuous Interest:**

Ex 5 You deposit $10,000 in an account that pays 6% interest. Find the balance after 10 years if the interest is compounded:

 a. quarterly b. continuously

Ex 6 $600 is deposited into an account that pays 7% annual interest, compounded continuously. What is the balance after 8 years?

Ex 7 $1250 is now in an account that pays 6.5% annual interest compounded continuously. What was the initial deposit if that was 8 years ago?

Ex 8 $3000 is deposited into an account that pays 5% annual interest. Compare the balance at the end of 10 years compounded:

 a. continuously b. quarterly

**PRESENT VALUE**

1) Use the present value formula to find the monthly payment you would pay on a home mortgage if the present value is $121,000, the annual interest rate is 7.5%, and payments will be made for 30 years.

2) How much is the monthly payment if the borrowers choose a loan with a 20 year term and an interest rate of 7.25%?

3) How much will be paid in total over the course of each loan?

4) How much will be paid in interest over the course of each loan?

5) Explain why a borrower might choose each of the loans above.

6) Tom is planning to buy an $18,000 car. The loan is for 5 years at a rate of 10.5%.

  a. What will be the monthly payments?

 b. How much money will he have paid the loan company for the car?

  c. How much interest will he have paid over the 5 years?

**Future Value:**

1) When Connie Hockman began her first job at the age of 22, she started saving for her retirement. Each quarter she places $1000 in an account that will earn an average 4.75% annual interest until she retires at 65. How much will be in the account when she retires?

2) If Ms. Hockman had invested in an account that earns an average of 5.25% annual interest, how much more would her account be worth?

3) How much of each account is money deposited by Connie?

4) How much of each account is interest accumulated?

5) Amanda is opening an IRA account. She plans to put $150 in the account each month for 30 years. She hopes to earn an average APR of 4 ½ % over 30 years.

  a. How much will her account be worth in 30 years?

6) You are investing $15,000 in to the bank with an annual interest rate of 4 ¾ %. Find the amount of each:

  a. Compounded quarterly for 8 years

 b. Compounded semiannually for 6 years

 c. Compounded continuously for 9 years

7) Mr. Hinson is planning to buy the “BIG” house in Farmwood for $750,000. He plans to take out a 30 year mortgage with an interest rate of 8 ½ %.

  a. What will be the monthly payments

 b. How much money will he have paid the mortgage company in 30 years?

  c. How much interest will he have paid over the life of the loan?

**1 – 5 Given the initial, compounding frequency and time, find the final amount.**

1) $ 700, 7% annually, 5 years

2) $ 7000, 11% continuously, 15 years

3) $ 5000, 8% quarterly, 5 years

4) $ 20,000, 7.5% monthly, 8 years

5) $ 8,000, 8.3% daily, 4 years

6) Tom contributes $ 50 monthly into an IRA annuity for 15 years. Assuming the IRA earns 5.5% annual interest, what is the value of Tom’s IRA account after 15 years?

7) Mary contributes to a retirement annuity in which she earns 8.5 % annual interest compounded quarterly. If she wants to accumulate $125,000 by the end of 18 years, how much should she invest each quarter?

8) A $1580 investment earns interest compounded annually. Determine the annual interest rate if the value of the investment is $3,000 after 8 years.