4.3 interest

Tuesday, September 5, 2017 1:18 PM

What You Will Learn

- Describe how a savings account works.
- Explain the restrictions on a certificate of deposit.
- Describe how a money market account differs from other savings accounts.
- Calculate simple and compound interest.

Principal - The money you begin an account with
Interest - The money your Principal earns.

Ways to save:

- Savings accounts
- Certificate of Deposit (CD) Better Interest
  - Requires that you leave your money in and do not add any money for a certain amount of time
  - In return you get a better interest rate than typical savings accounts.
- Money Market Accounts
  - Similar to a simple savings account
    - You can typically make several withdraws and/or deposits
  - Different from simple savings account
    - Interest rate can change depending on the market conditions.

Simple interest

- Annual percentage Rate (APR)
  - The speed (amount) that your principal grows by.
  - The rate of return on an investment for a one-year period.

Compound interest

- Interest calculated on the principal and accumulated interest.
  - Can happen:
    - Annually
    - Semi-annually
    - Quarterly
    - Monthly
    - Weekly
    - Daily
    - Continuously

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  125
+  31.25
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 156.25
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Calculating simple interest
Interest = principal x interest rate
I=Pr
New balance = principal (1 + interest rate)
M=P(1+r)

1.25% → .0125

Lisa Marie deposited $575 into an account that earns simple interest at a rate of 1.25% per year. At the end of two years, what is the balance of Lisa

Marie's account, assuming that she makes no additional deposits?

$m = P(1+r)$ $P = 575$ $r = .0125$ $I = Pr$

$m = 575(1+.0125)$ $575 \cdot .0125$

$m = 582.1875$ $I = 7.1875$

$\$582.19$ $\$7.19$

Calculating simple interest

Interest = principal x interest rate

I=Pr

New balance = principal (1 + interest rate)

M=P(1+r)

Changing APR to different time periods

Interest rate for new time period = APR(1/number of periods per year)

I=APR(1/n)

Gerald deposited $750 into an account that earns simple interest at a rate of 2.29% per year. If Gerald leaves this money in the account for three years, what will be the account balance at the end of the three years? Assume that he makes no additional deposits into the account during this time.

$P = \$750$ $r = .0229$

$m = P(1+r)$

$750(1+.0229)$

$750(1.0229)$

$m = 767.175$

$= 767.18$

Compounding interest

New balance = principal x $(1+\text{interest rate})^{\text{time invested}}$

$M=P(1+r)^t$

Ali inherited $5,000 from her grandmother. She deposited the money into a savings account that earns 3% compound interest annually. If Ali leaves the money in this account for 20 years and makes no additional deposits, what will the account balance be? Also, what would the account balance be if she had only received straight interest instead of compound interest?

$P = 5000$ $r = .03$

$m = 5000(1+.03)$

$5000(1.03)$

$\$5150$

$\$8000$

$m = P(1+r)^t$

$5000(1.03)^{20}$

$5000(1.80611)$

$m = 9030.56$

Compounding interest with more than one calc per year

New balance = principal x $\left(1+\frac{\text{interest rate}}{\text{number of calcs per year}}\right)^{\text{time invested x number of calcs per year}}$

$M=P\left(1+\frac{r}{n}\right)^{nt}$

Garrett received a bonus check from work for $3,760. He decided to invest the money in an account that yields 4% compound interest for 4 years. Should Garrett ask to have his account calculated 1 time per year, 4 times per year, or 12 times per year? What would Garrett's balance be for each of these possibilities?

P 3,760 $r = .04$

$m = P\left(1+\frac{r}{n}\right)^{nt}$

$3760\left(1+\frac{.04}{1}\right)^{1\cdot 4}$

$3760\left(1+\frac{.04}{4}\right)^{4\cdot 4}$

$3760\left(1+\frac{.04}{12}\right)^{12\cdot 4}$

P 3,760
$r = .04$
$t = 4$
$n = 1$
$h = 4$

$A = P\left(1 + \frac{r}{n}\right)^{nt}$

$3760\left(1 + \frac{.04}{1}\right)^{1 \cdot 4}$

$3760(1 + .04)^4$

$A = 4398.67$

$3760\left(1 + \frac{.04}{4}\right)^{4 \cdot 4}$

$3760\left(1 + \frac{.04}{4}\right)^{16}$

$A = 4408.90$

$3760\left(1 + \frac{.04}{12}\right)^{12 \cdot 4}$

$3760\left(1 + \frac{.04}{12}\right)^{48}$

$A = 4411.23$

Practice sec 6.5 **pg.**
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