Section 3-3, Future Value of an Annuity; Sinking Funds

An **annuity** is any sequence of equal periodic payments. If payments are made at the end of each time interval, then the annuity is called an **ordinary annuity**. The amount, or **future value**, of an annuity is the sum of all payments plus all interest earned.

Future Value of an Ordinary Annuity $FV = PMT \frac{(1+i)^n - 1}{i}$ where PMT = periodic payment i = rate per period n = number of payments (periods) FV = future value (amount)[Note: Payments are made at the end of each period.]

Q1 (#22, page 156). Recently, USG Annuity and Life offered an annuity that pays 7.25% compounded monthly. If \$1000 is deposited into this annuity every month, how much is in the account after 15 years? How much of this is interest?

Q2 (#26, page 157). Recently, The Hartford offered an annuity that pays 5.5% compounded monthly. What equal monthly deposit should be made into this annuity in order to have \$100,000 in 10 years?

Q3 (#30, page 157). If \$2000 is deposited at the end of each quarter for 2 years into an ordinary annuity earning 7.9% compounded quarterly, construct a balance sheet showing the interest earned during each quarter and the balance at the end of each quarter.

Period	Amount	Interest	Balance
1	\$2,000.00	\$0.00	\$2,000.00
2	\$2,000.00		
3	\$2,000.00		
4	\$2,000.00	\$120.86	\$8,240.14
5	\$2,000.00	\$162.74	\$10,402.88
6	\$2,000.00	\$205.46	\$12,608.34
7	\$2,000.00	\$249.01	\$14,857.35
8	\$2,000.00	\$293.43	\$17,150.78

Any account established for accumulating funds to meet future obligations or debts is called a **sinking fund**.

Q4 (#40, page 157). A company establishes a sinking fund for upgrading office equipment with monthly payments of \$2000 into an account paying 0.55% monthly interest. How long will it be before the account has \$100,000? (Round up to the nearest month if not exact.)