

ANNUITIES

DEFINITIONS:

Annuity: equal payments paid at equal time intervals.

Payment period: time between successive payments.

Periodic payment: the amount of each payment.

Ordinary annuity: periodic payments made at the end of each period

FORMULAS AND EXAMPLES:

$$A = RS, \text{ where } S = \frac{(1+i)^n - 1}{i}$$

(FV of an ordinary annuity)

i = interest rate per period.

n = number of periods.

R = amount of each periodic payment (sometimes denoted by PMT).

A = **FV** or amount.

EXAMPLE: A family enters a savings plan whereby they will invest \$1000 at the end of each year for 5 years. The annuity will pay 7% interest compounded annually. Find the value of the annuity at the end of the 5 years.

Step 1:

$$i = .07$$

$$n = 5$$

$$R = 1000$$

Step 2: $S = \frac{(1+i)^n - 1}{i}$

and $A = RS$

Step 3: $S = \frac{(1+.07)^5 - 1}{.07} = 5.75074$

Now solve for A:

$$A = RS = 1000 \times 5.75074 = \$ 5750.74$$