U7D3 Annuities

Annuity (Definition)

An annuity is series of regular payments (or withdrawals) of the same amount each time. Two basic types of annuity problems:

1. 2.

Method 1 : Using a timeline.

Ex #1 – Find the future value of \$500 deposited at the end of each year for 4 years at an annual interest rate of 8% compounded annually.

Use $A=(1+i)^n$ for each deposit

<u>Now 1st payment 2nd payment 3rd payment 4th</u> \$500 \$500 \$500 \$500

Therefore, the annuity will be worth \$

Method 2 : Using the Annuity Formula.

$$A = \frac{R[(1+i)^n - 1]}{n}$$

Where A is the accumulated amount of the annuity including interest

R is the "regular" payment or deposit

i is the interest rate per compounding period

n is the number of payments

Ex #1 – Find the future value of \$500 deposited at the end of each year for 4 years at an annual interest rate of 8% compounded annually.

Method 3: Using technology: Ex #1 – Find the future value of \$500 deposited at the end of each year for 4 years at an annual interest rate of 8% compounded annually.

TVM Advanced Calculator		
Mode	End Beginning	
Present Value		PV
Payment		PMT
Future Value		FV
Annual Rate (%)	Annually	Rate
Periods	Monthly	Periods
Compounding	Monthly	

Solve numbers 1 with a timeline and 2 with the annuity formula.

- Find the future value of \$400 deposited at the beginning of each year for 4 years at an annual interest rate of 4.3% compounded annually. Check your answer with the annuity formula. Answer: \$1706.19
- If your parents deposit \$100 every month into an education fund, for 18 years, how much will be in the account at the time of the last deposit. Interest rate is 3%/a compounded monthly. Answer: \$28 594.03
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