



Professional Development Programme on Contemporary Perspective of Personal Financial Management

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Course Content

Day Two AM Session

- Part 1: Basic Concepts in Time Value of Money
- Part 2: Personal Consumer Finance & Credit

Day Two PM Session

- Part 1: Risks and Returns
- Part 2: Lifecycle Financial Planning Approach

Basic Concepts in Time Value of Money

Basic Concepts in Time Value of Money

- Opportunity Cost and Time Value of Money
- Compound Interest
- Future Value
- Present Value
- Frequency of Compounding
- Annuities

Basic Concepts in Time Value of Money

Which would you rather have -- \$1,000 today
or \$1,000 in 5 years?

Basic Concepts in Time Value of Money

TIME allows one the *opportunity* to postpone consumption and earn interest.

Not having the opportunity to earn interest on money is called **OPPORTUNITY COST**.

Basic Concepts in Time Value of Money

- Opportunity cost is an important economic principle that affects the value of our financial decisions.
- For example, if we make a \$1,000 payment on a 12% credit card, we can lower our interest expense. For one month alone, we save \$10 in interest ($\$1,000 * 0.12/12$).
- However, in order to pay down this debt, we may have passed up an opportunity to earn a 5% annual interest rate in a fixed deposit.
- The opportunity cost, in this case, is \$4.17 ($\$1,000 * .05/12$) in interest income.
- Subtracting the opportunity cost of \$4.17 from the debt savings of \$10, we obtain a net savings of \$5.83.

Basic Concepts in Time Value of Money

Compound Interest

- When interest is paid on not only the principal amount invested, but also on any previous interest earned, this is called compound interest.

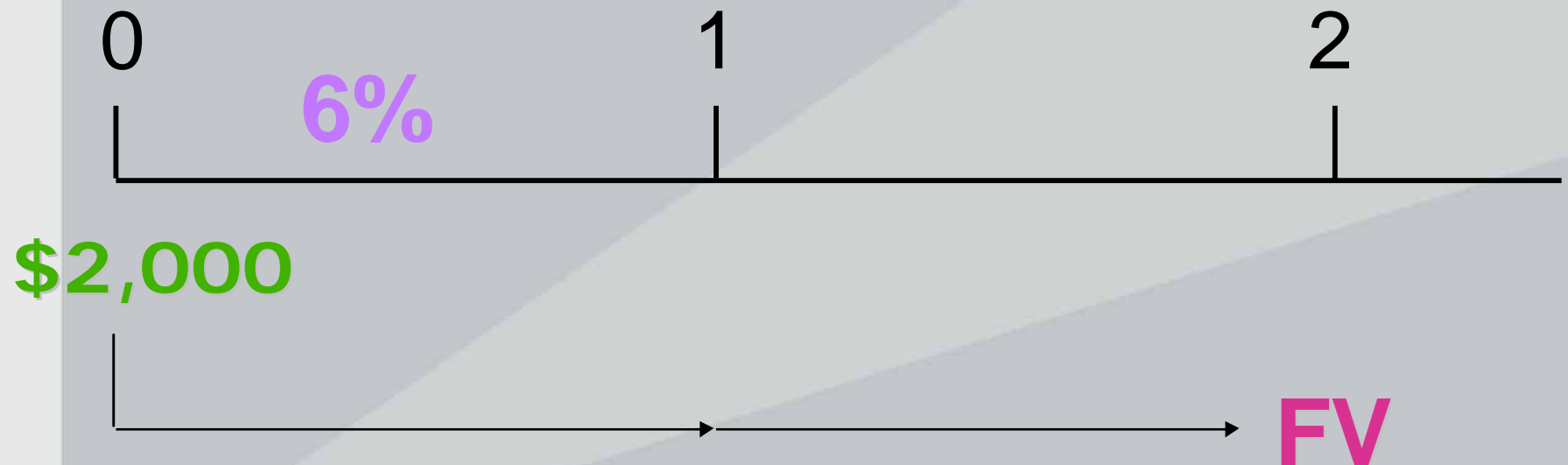
$$\begin{aligned} \text{FV} &= \text{Principal} + (\text{Principal} \times \text{Interest}) \\ &= 2000 + (2000 \times .06) \\ &= 2000 (1 + i) \\ &= \text{PV} (1 + i) \end{aligned}$$

Note: PV refers to Present Value or Principal

Basic Concepts in Time Value of Money

Future Value

If you invested \$2,000 today in an account that pays 6% interest, with interest compounded annually, how much will be in the account at the end of two years if there are no withdrawals?

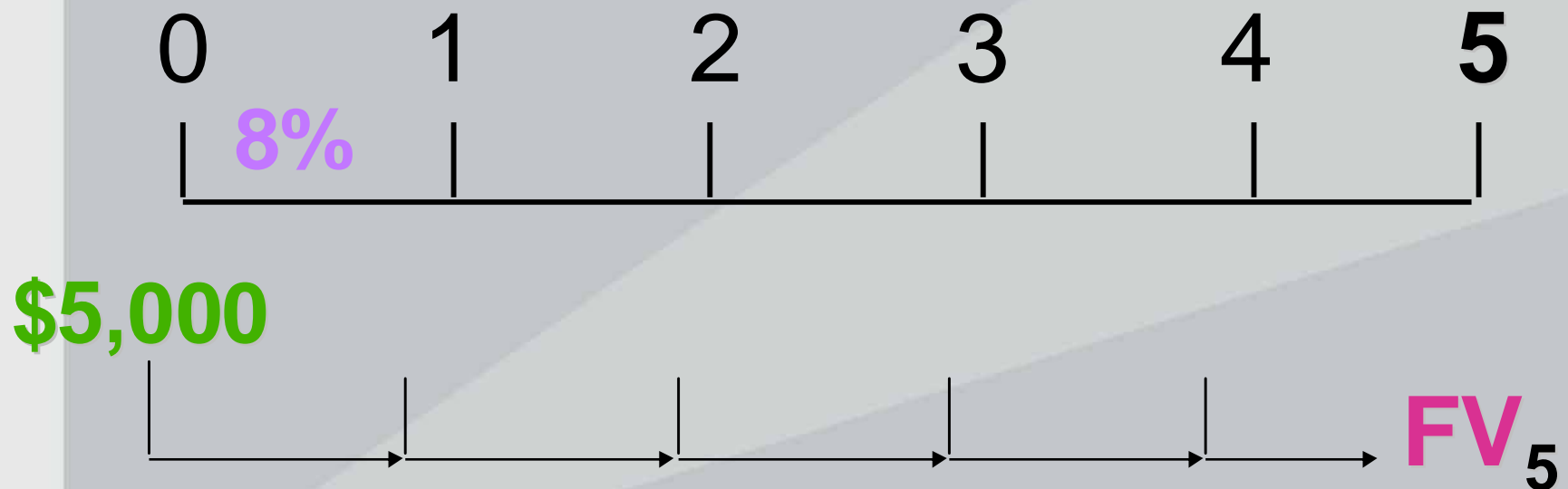


Basic Concepts in Time Value of Money

- FV = future value, a value at some future point in time
PV = present value, a value today which is usually
designated as time 0
i = rate of interest per compounding period
n = number of compounding periods

Basic Concepts in Time Value of Money

John wants to know how large his \$5,000 deposit will become at an annual compound interest rate of 8% at the end of 5 years.



Basic Concepts in Time Value of Money

Calculation based on general formula:

$$FV_n = PV (1+i)^n$$

$$FV_5 =$$

$$=$$

Basic Concepts in Time Value of Money

How long does it take to double \$5,000 at a compound rate of 12% per year (approx.)?

We can use the "Rule-of-72".

Basic Concepts in Time Value of Money

How long does it take to double \$5,000 at a compound rate of 12% per year (approx.)?

Approx. Years to Double = $72 / i\%$

Basic Concepts in Time Value of Money

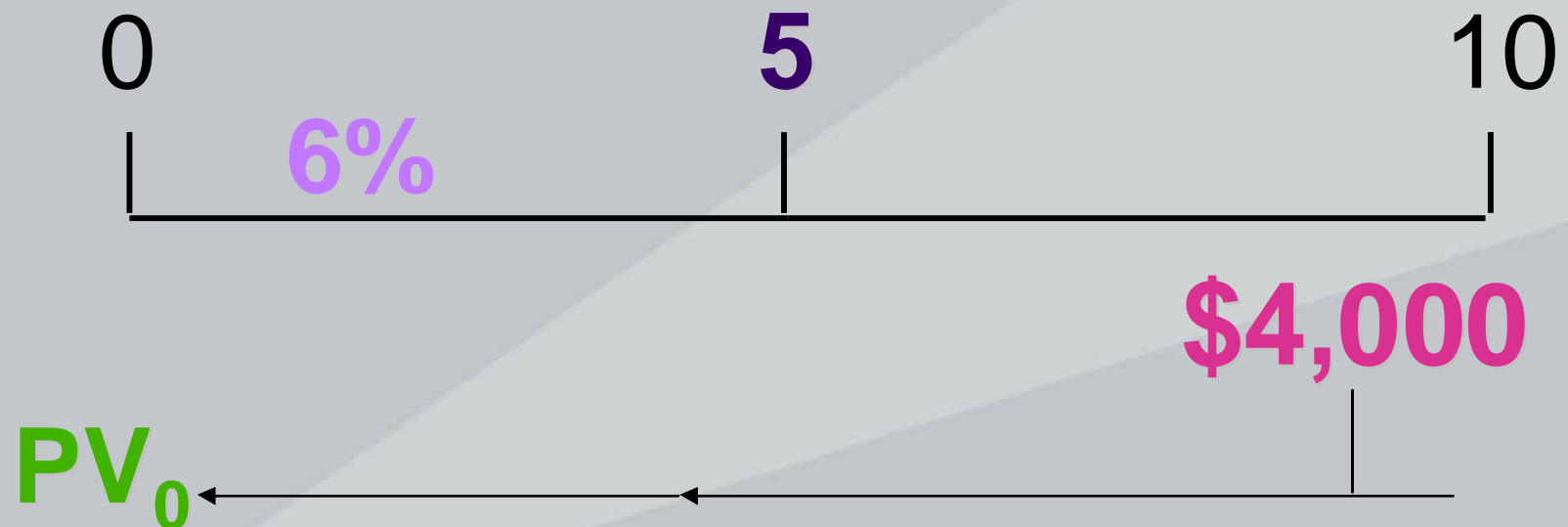
- Since $FV = PV(1 + i)^n$.

$$PV = FV / (1 + i)^n.$$

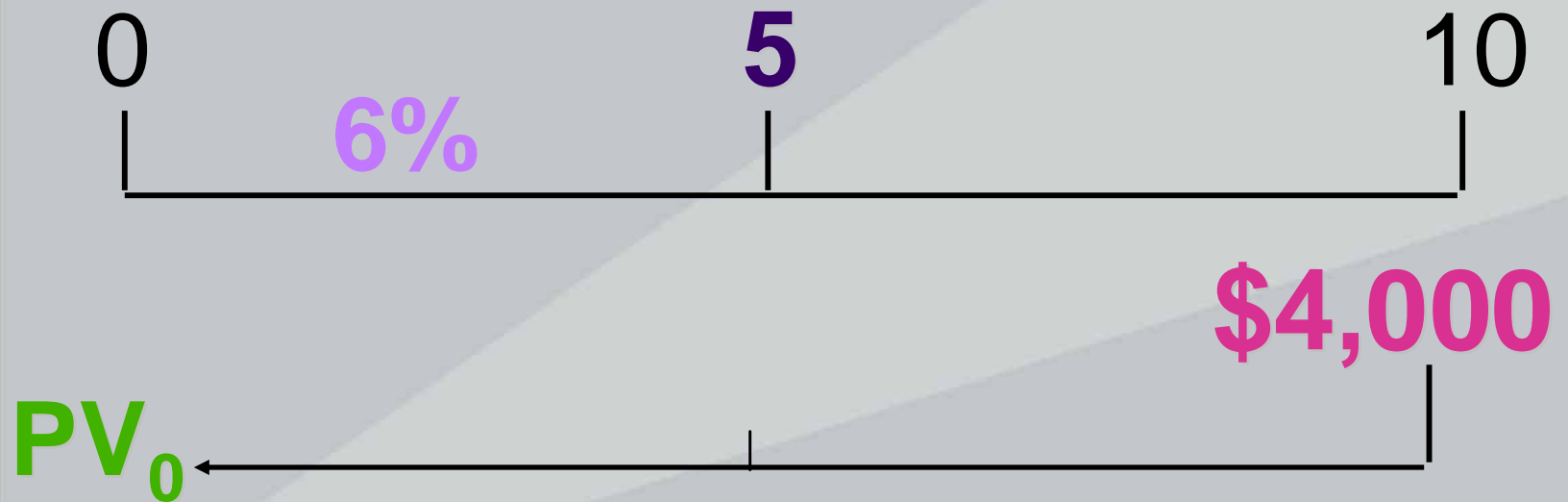
- Discounting is the process of translating a future value or a set of future cash flows into a present value.

Basic Concepts in Time Value of Money

Assume that you need to have exactly \$4,000 saved 10 years from now. How much must you deposit today in an account that pays 6% interest, compounded annually, so that you reach your goal of \$4,000?

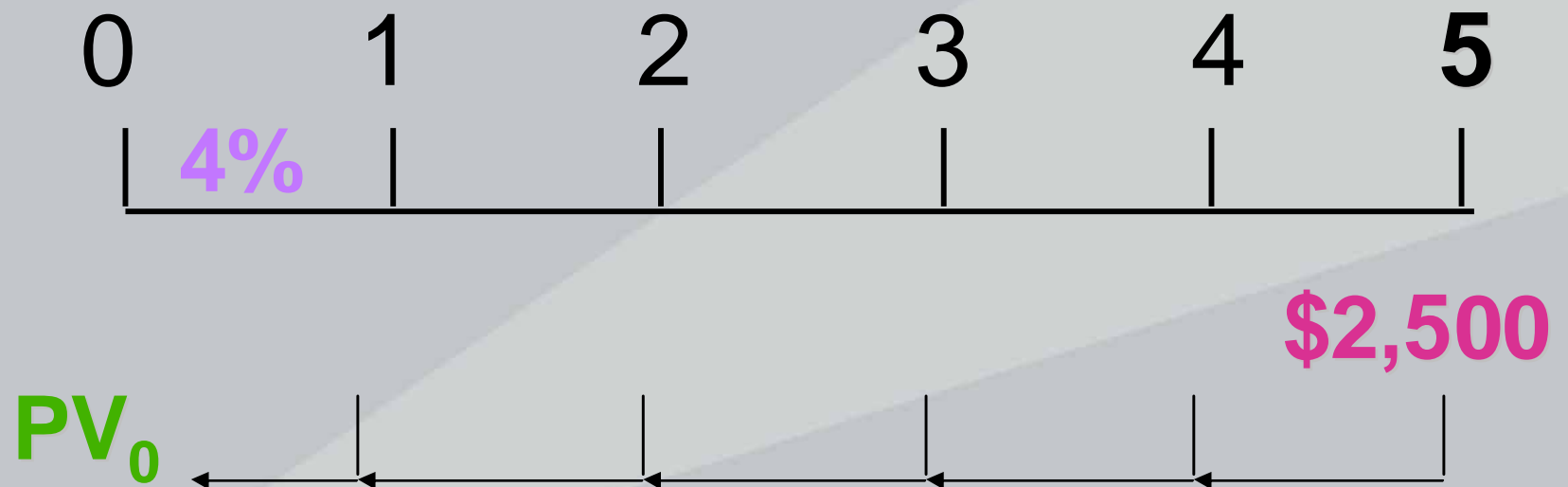


Basic Concepts in Time Value of Money



Basic Concepts in Time Value of Money

Joann needs to know how large of a deposit to make today so that the money will grow to **\$2,500** in 5 years. Assume today's deposit will grow at a compound rate of **4%** annually.



Basic Concepts in Time Value of Money

- Calculation based on general formula:

$$PV_0 = FV_n / (1+i)^n$$

Basic Concepts in Time Value of Money

If one invests \$2,000 today and has accumulated \$2,676.45 after exactly five years, what rate of annual compound interest was earned?

Basic Concepts in Time Value of Money

General Formula:

$$FV_n = PV_0(1 + [i/m])^{mn}$$

n : Number of Years

m : Compounding Periods per Year

i : Annual Interest Rate

$FV_{n,m}$: FV at the end of Year n

PV_0 : PV of the Cash Flow today

Basic Concepts in Time Value of Money

- Suppose you deposit \$1,000 in an account that pays 12% interest, compounded quarterly. How much will be in the account after eight years if there are no withdrawals?

PV =

i =

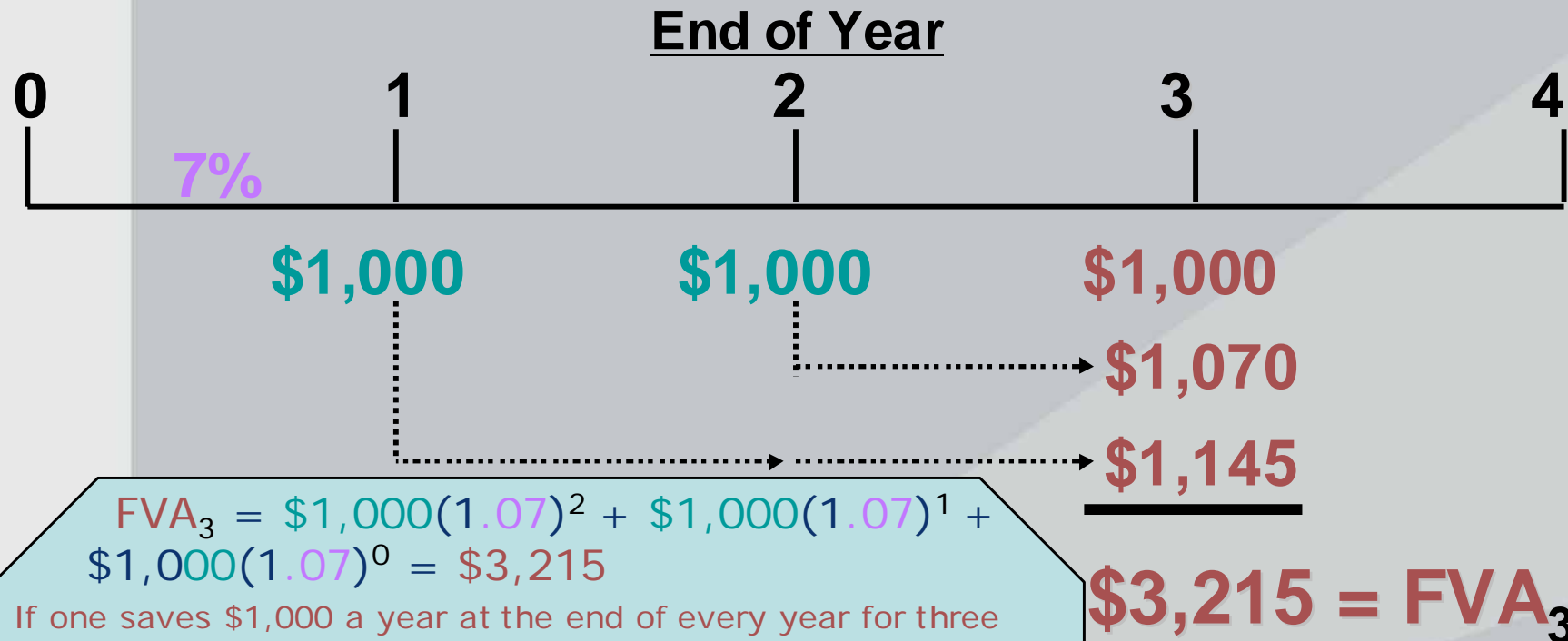
n =

$$FV = PV (1 + i)^n$$

Basic Concepts in Time Value of Money

- An Annuity represents a series of equal payments (or receipts) occurring over a specified number of equidistant periods.
- Examples of Annuities Include:
 - Student Loan Payments
 - Car Loan Payments
 - Insurance Premiums
 - Mortgage Payments
 - Retirement Savings

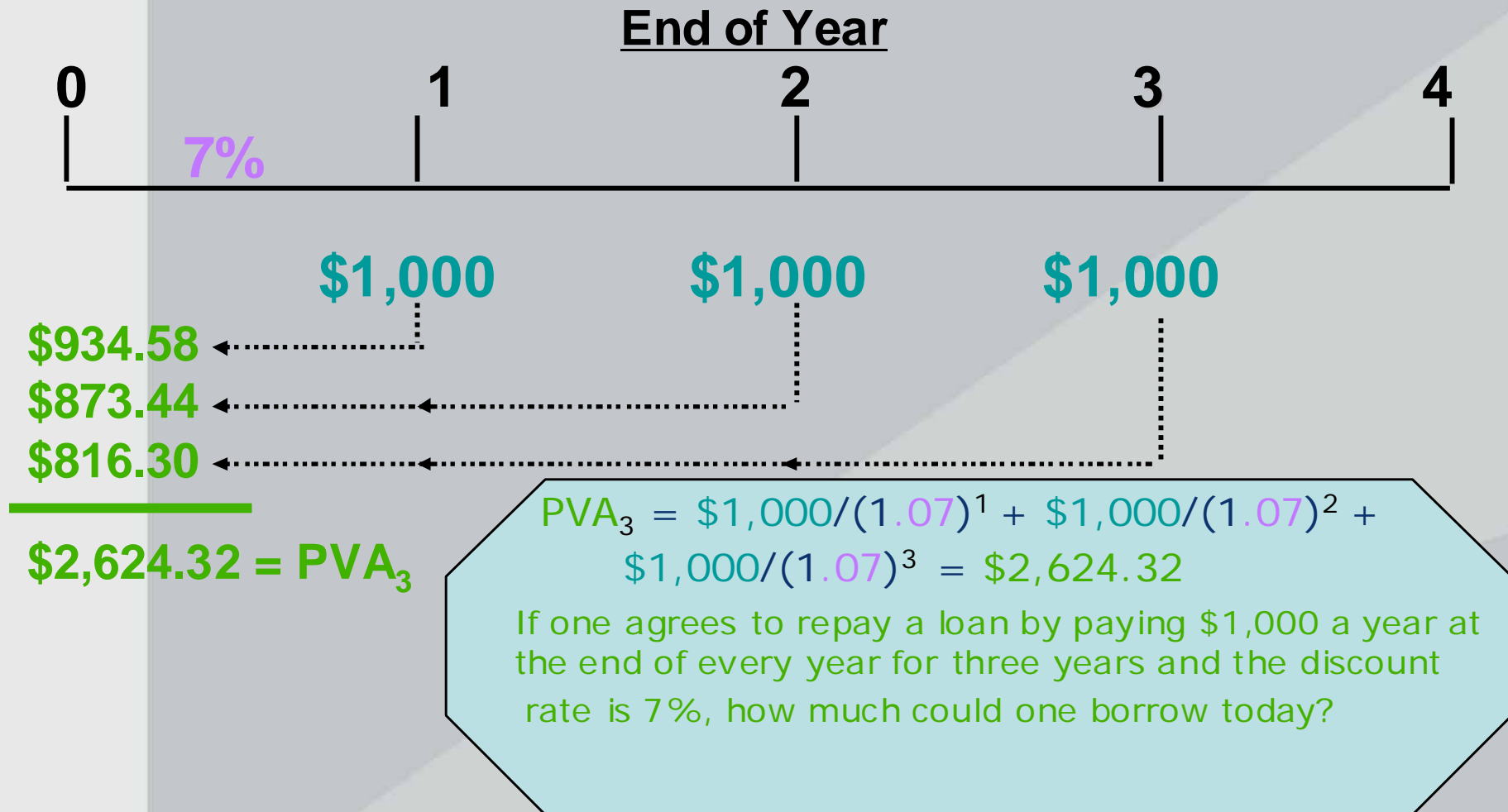
Basic Concepts in Time Value of Money



$$FVA_3 = \$1,000(1.07)^2 + \$1,000(1.07)^1 + \$1,000(1.07)^0 = \$3,215$$

If one saves \$1,000 a year at the end of every year for three years in an account earning 7% interest, compounded annually, how much will one have at the end of the third year?

Basic Concepts in Time Value of Money



Basic Concepts in Time Value of Money

END of this Session