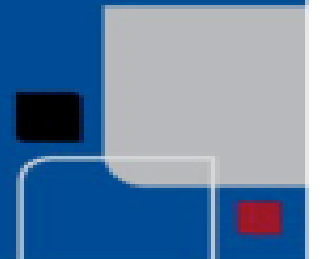Integrated Financial Planning: Time Value of Money

1.1 Child Education Planning,
2.Retirement Planning (Importance I/Y),
3.2 Child Education Planning,
4.1 Child Care Planning,
5.2 Child Care Planning.

CFP Certification *Global excellence in financial planning*

Integrated Financial Planning: Time Value of Money

1.1 Child Education Planning,

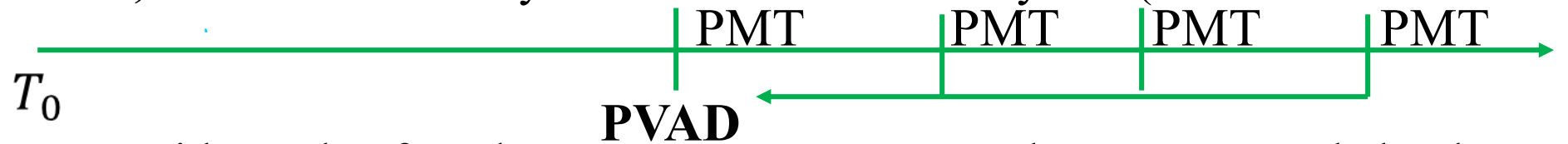**CFP Certification** *Global excellence in financial planning*

➢ The 3 steps for the calculations for retirement planning and education planning are the same to determine a lump sum required today.

➢ We use education planning in insurance planning when we want to know a lump sum amount T= 0 to fund future education.

➢ We use education planning in basic family financial planning for determining a yearly or monthly savings target

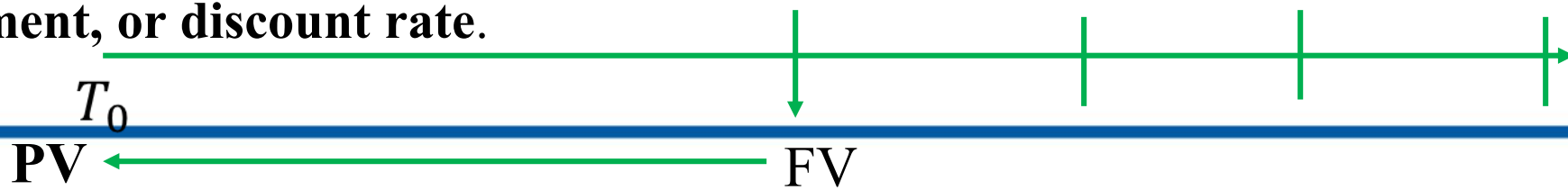➢ The 3 steps for the calculations for retirement planning and education planning are the same:

1. Step #1 Inflate the current cash flow amount or expense for the number of years until required (start of retirement or university i.e. in the future) to determine the first year's cash flow need. **This step uses the rate of inflation only.**

T_0 → **FV** Start Ed. or Ret.

2. Step 2. Calculate the amount needed at the beginning of retirement or university (i.e., not today) to fund the inflation-adjusted cash flow required for the client to maintain purchasing power throughout the anticipated retirement period. **This step uses the real (i.e., inflation-adjusted) rate of return,** and is almost always calculated as an annuity due (i.e. in BGN mode).

T_0 — PMT — PMT — PMT — PMT

PVAD

3. Step 3. The third step can either solve for a lump sum amount or annual payments needed today to accumulate the retirement fund. **As this step only involves the investment return, we will use the investment, or discount rate**.

T_0

PV ← FV

Let's assume your clients have one child who is currently six years old and will be in college for four years, beginning at age 18. We will further assume that a year of college expenses totals $12,000, inflation for college costs is four percent, and our clients can earn seven percent on their investments. We will apply the real/inflation-adjusted rate to reflect how inflation offsets investment return.

Step 1. Inflate $12,000 for 12 years at a 4% rate = $19,219.39

1.   12 N
2.   **4 I/YR**
3.   -12,000 PV
4.   0 PMT
5.   CPT FV = 19,212.39

T_0

FV
Start Ed.

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

Inflation and Serial Payments

The Fisher equation:

$$R_r = \left| \frac{1 + R_n}{1 + i} - 1 \right| \times 100$$

As an example, calculate the real return when the nominal return is 7 percent and inflation is 4.0 percent.

$$\left| \frac{1.07}{1.04} - 1 \right| \times 100 = 2.8846$$
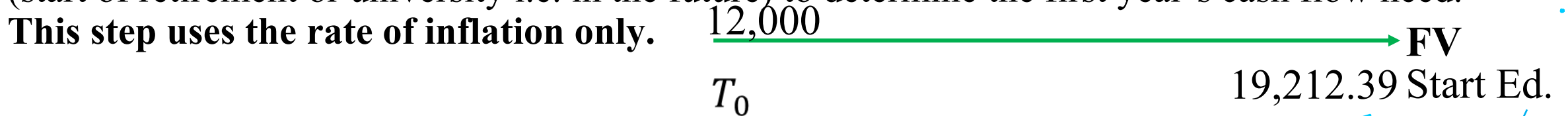
Where:

R_r = Real return

R_n = Nominal return

i = Inflation

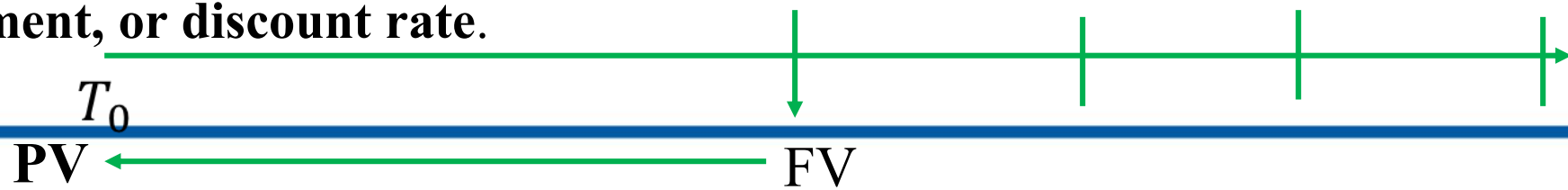➢ The 3 steps for the calculations for retirement planning and education planning are the same:

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$$\underset{T_0}{\underline{\hspace{2cm} 12,000 \hspace{4cm}}} \text{FV}$$

19,212.39 Start Ed.

2. Step 2. Calculate the amount needed at the beginning of retirement or university (i.e., not today) to fund the inflation-adjusted cash flow required for the client to maintain purchasing power throughout the anticipated retirement period. **This step uses the real (i.e., inflation-adjusted) rate of return,** and is almost always calculated as an annuity due (i.e. in BGN mode).

PMT   PMT   PMT   PMT

T_0

PVAD

3. Step 3. The third step can either solve for a lump sum amount or annual payments needed today to accumulate the retirement fund. **As this step only involves the investment return, we will use the investment, or discount rate.**

T_0

PV   FV

Let's assume your clients have one child who is currently six years old and will be in college for four years, beginning at age 18. We will further assume that a year of college expenses totals $12,000, inflation for college costs is four percent, and our clients can earn seven percent on their investments. We will apply the real/inflation-adjusted rate to reflect how inflation offsets investment return.

$$R_r = \left| \frac{1 + R_n}{1 + i} - 1 \right| \times 100$$
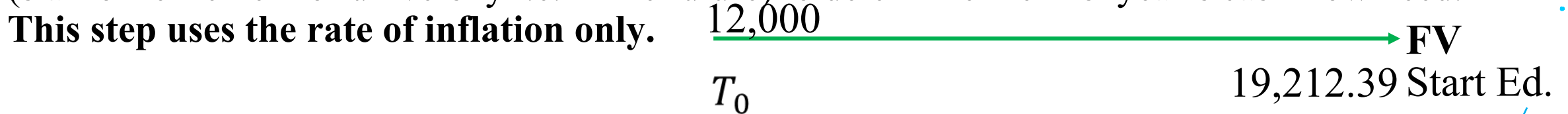
Step 2. Calculate the future amount needed to fund 4 years of payments that increase annually at the rate of inflation with remaining funds continuing to earn seven percent return. (Calculation done in BEGIN mode)

1.   4 N
2.   **2.8846 I/YR**
3.   -19,212 PMT
4.   0 FV
5.   CPT PV = 73,676.07

Inflation-adjusted interest rate calculation: [(1.07 / 1.04 – 1] x 100 = **2.8846%**

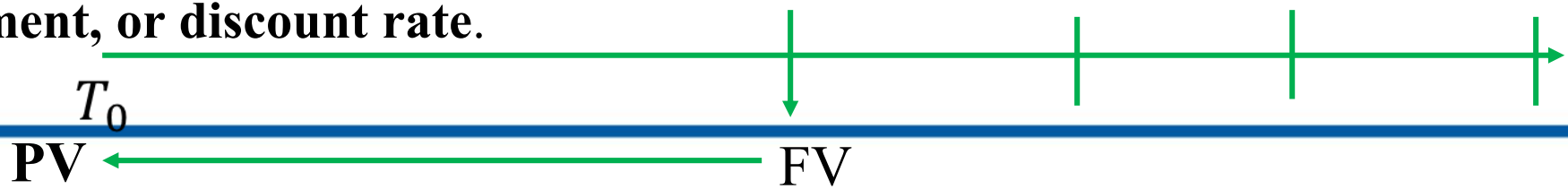➢ The 3 steps for the calculations for retirement planning and education planning are the same:

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12,000
_____→ **FV**
T_0
19,212.39 Start Ed.

2. Step 2. Calculate the amount needed at the beginning of retirement or university (i.e., not today) to fund the inflation-adjusted cash flow required for the client to maintain purchasing power throughout the anticipated retirement period. **This step uses the real (i.e., inflation-adjusted) rate of return,** and is almost always calculated as an annuity due (i.e. in BGN mode).

PMT   PMT   PMT   PMT
_____→
T_0
73,676.07
PVAD

3. Step 3. The third step can either solve for a lump sum amount or annual payments needed today to accumulate the retirement fund. **As this step only involves the investment return, we will use the investment, or discount rate.**

T_0
PV   FV

Let's assume your clients have one child who is currently six years old and will be in college for four years, beginning at age 18. We will further assume that a year of college expenses totals $12,000, inflation for college costs is four percent, and our clients can earn seven percent on their investments. We will apply the real/inflation-adjusted rate to reflect how inflation offsets investment return.

Step 3. Discount the amount from Step 2 - 12 years back to "today" to determine the lump sum needed to fund the future income stream.
1.   12 N
2.   **7 I/YR**
3.   0 PMT
4.   73,678 FV
5. CPT PV = 32,714

(Use the 7% discount rate rather than the inflation-adjusted (real) rate because you are just determining the investment amount and have already factored inflation in the calculation.)

Let's assume your clients have one child who is currently six years old and will be in college for four years, beginning at age 18. We will further assume that a year of college expenses totals $12,000, inflation for college costs is four percent, and our clients can earn seven percent on their investments. We will apply the real/inflation-adjusted rate to reflect how inflation offsets investment return.

Step 3. We could also adjust question – how much has to be saved at the end of each month to reach that same goal? Mode = End, P/Y = 12
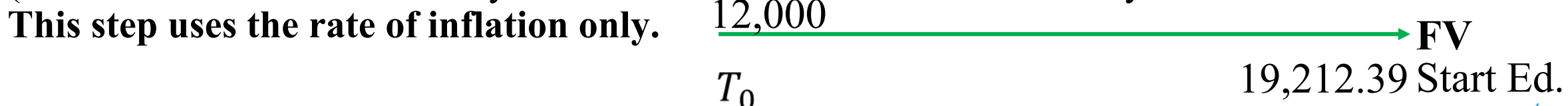
1.   12 x 12 = 144 N
2.   **7 I/YR**
3.   0 PV
4.   -73,678 FV

(Use the 7% discount rate rather than the inflation-adjusted (real) rate because you are just determining the investment amount and have already factored inflation in the calculation.)

5. CPT PMT = 327.90

Can your client $327.90 each month to reach the goal?

➢ The 3 steps for the calculations for retirement planning and education planning are the same:

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$$\underset{T_0}{\underline{\hspace{3cm}}\ 12,000\ \underline{\hspace{5cm}}} \longrightarrow \textbf{FV}$$

19,212.39 Start Ed.

2. Step 2. Calculate the amount needed at the beginning of retirement or university (i.e., not today) to fund the inflation-adjusted cash flow required for the client to maintain purchasing power throughout the anticipated retirement period. **This step uses the real (i.e., inflation-adjusted) rate of return,** and is almost always calculated as an annuity due (i.e. in BGN mode).

PMT   PMT   PMT   PMT

$$T_0 \quad\quad 73,676.07$$
PVAD

3. Step 3. The third step can either solve for a lump sum amount or annual payments needed today to accumulate the retirement fund. **As this step only involves the investment return, we will use the investment, or discount rate.**

32,704 T_0 328

PV ⟵ FV