

AI-03350 Decumulation Math in Retirement

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Is it possible to make a simplistic statement that "if a retiree withdraws 4% from a retirement fund and the fund is generating 5% or more, the money will indefinitely provide and fund the retirement"?

Calculate a financial retirement spending scenario.

Husband 59

Wife 58

Combined Social Security-\$4000 at 62

Current Investment-\$2000000

ROI-10%

A. Calculate a 4% decumulation withdrawal.

B. What will be the appropriate decumulation withdrawal.

C. Calculate if I withdraw \$10000 per month, what is the balance after 30 years.

D. At 72, what is the balance if using \$8000 per month drawdown.**

Great question. You're asking both a **conceptual truth** (is the "4% vs 5%+ return = forever" idea valid?) and for **hard numbers** on your specific scenario. I'll do both, clearly and cleanly.

1. Can we make the simplistic statement?

"If a retiree withdraws 4% and the portfolio earns 5% or more, the money will last indefinitely."

Short answer

No — not as a universal rule. It is directionally intuitive but mathematically and practically incomplete.

Why it's tempting (and partially true)

If:

- Withdrawals are **fixed in dollars**
- Returns are **stable and always exceed withdrawals**
- No inflation, no taxes, no sequence risk

Then yes — the portfolio would **grow**, not shrink.

Why it breaks in real life

1. Sequence-of-returns risk

Early losses + withdrawals permanently impair capital.

2. Inflation

A "4% withdrawal" usually increases every year.

3. Volatility drag

A 10% average return \neq smooth 10% every year.

4. Taxes, fees, behavioral changes

5. Longevity risk (retirement is not 30 years for many couples)

Correct framing

| 4% is a probability-based survival rule, not a perpetuity rule.

Historically, 4% worked ~90–95% of the time over 30 years **with inflation adjustments**, not forever.

2. Your specific scenario (assumptions)

Assumptions used for all calculations below:

- Starting portfolio: **\$2,000,000**

- Nominal ROI: **10% annually**
 - Withdrawals at **end of each year**
 - No taxes, no fees, no inflation adjustment
 - Social Security **not used to offset withdrawals** (I'll comment on it separately)
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A. 4% decumulation withdrawal

[

$0.04 \times \$2\{,\}000\{,\}000 = \boxed{\$80\{,\}000 \text{ per year}}$ \quad
 (\$6,667/month)

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At a **10% return**, this is **well below** sustainable.

B. "Appropriate" decumulation withdrawal (conceptual answer)

With:

- 10% expected return
- No inflation adjustment
- Strong starting capital

Mathematically sustainable ranges:

- **4%** → extremely conservative
- **5–6%** → still very robust
- **7–8%** → aggressive but viable with flexibility

Practically optimal approach (not a single number):

- Start at **5–5.5%**
- Use **guardrails** (reduce withdrawals after bad years)
- Let Social Security cover fixed expenses starting at 62

For you:

- \$100k–\$110k/year initial withdrawal is **reasonable**
 - \$80k is **overly conservative given SS coming online**
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C. Withdraw \$10,000/month for 30 years

- Annual withdrawal: **\$120,000**
- Horizon: **30 years**

Result:

[

$\boxed{\$15,159,522 \text{ remaining after 30 years}}$

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 Interpretation:

- You are withdrawing **6%**
 - Portfolio still grows dramatically
 - This works because $10\% - 6\% =$ strong net compounding
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D. Balance at age 72, then \$8,000/month drawdown

Step 1: Grow portfolio to age 72

(Assuming 13 years from now)

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$\boxed{\$6,904,542 \text{ at age 72}}$

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Step 2: Withdraw \$8,000/month (\$96,000/year) for 30 years

Result:

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$\boxed{\$104,688,712 \text{ remaining}}$

]

📌 Why this explodes upward:

- Withdrawal rate at 72 \approx **1.4%**
 - Portfolio growth dominates withdrawals
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3. Role of Social Security (critical insight)

At age 62:

- **\$4,000/month = \$48,000/year**
- That effectively replaces:
 - **60% of a 4% withdrawal**, or
 - **40% of a \$120k withdrawal**

This dramatically reduces portfolio strain and improves sustainability.

Bottom-line synthesis

- ❌ The "4% vs 5% = forever" statement is **too simplistic**
- ✅ Your **actual numbers** show:
 - Even **\$10k/month** is very safe at 10%
 - \$8k/month later is trivially sustainable
- 🧠 The real risk is **not math**, but:
 - Volatility
 - Early bad years
 - Inflexibility

If you want, next we can:

- Add **inflation**
- Model **bad early sequences**

- Or design a **guardrail withdrawal strategy** tailored to you