1. Which of the following apply to why the lump sum formula holds?

- we used each short-term compounding period (local) to build upon and derive a global formula for the total savings plus intest
- we took a process that originally had too many terms (one for each compounding period)
- we reduced it to something manageable by finding the commonality of multiply by (1 + rate) and applying the algebra of exponents
- this class is intended to be “plug and chug” so we never derived the lump sum formula—it was presented as mathematical magic

a) all but the last statement

b) only the last statement

c) other

2. If a certificate of deposit (c.d.) will be compounded monthly at 3% for 14 years, and William put in $2000, then what is the formula that represents how much would the c.d. be worth at the end of 14 years?

a) $2000(1 + .03)^{14}$

b) $2000(1 + \frac{.03}{14})^{14 \times 12}$

c) $2000(1 + \frac{.03}{12})^{14 \times 12}$

d) $2000(1 + \frac{.03}{12})^{14}$

e) none of the above

3. If a certificate of deposit (c.d.) will compounded monthly at 3% for 14 months, and William put in $2000, how much would the c.d. be worth at the end of 14 months (answer in dollars and cents)? **Caution**: the previous question asks about 14 years but this problem asks about 14 months.

a) $3025.18
b) $2865.55
c) $3042.33
d) $2071.15
e) none of the above

An exclusive conversation with Warren Buffett—PBS

Oct 3, 2008

`https://www.youtube.com/watch?v=ejIWp5E8_Fo`

- What is the problem with Americans keeping their money under their mattress?
- What does Warren Buffett mean by an economic Pearl Harbor?

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total = principal $(1 + \text{periodic rate})^{\text{number of times we actually compound}}$
application of algebra of factoring (1+rate)
application of algebra of exponents

What is the *interest* when $37 is deposited today into an account that earns 12.99% compounded monthly for 2 years?

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$37(1 + \frac{.1299}{12})^{24}$

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$37(1 + \frac{.1299}{12})^{24} - 37 = \$10.91$

Futurama: A Fishful of Dollars

Bank Teller: *Ok. You had a balance of 93 cents... and at an average of two and a quarter percent interest [compounded annually] over a period of 1000 years, that comes to...*

Futurama: A Fishful of Dollars

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4.3 billion dollars

Futurama: A Fishful of Dollars

$$.93(1 + .0225)^{1000}$$

Futurama: A Fishful of Dollars

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4.3 billion dollars

Futurama: A Fishful of Dollars

$$.93(1 + .0225)^{1000} \approx \$4,283,508,449.71$$

Actually it was Benjamin Franklin

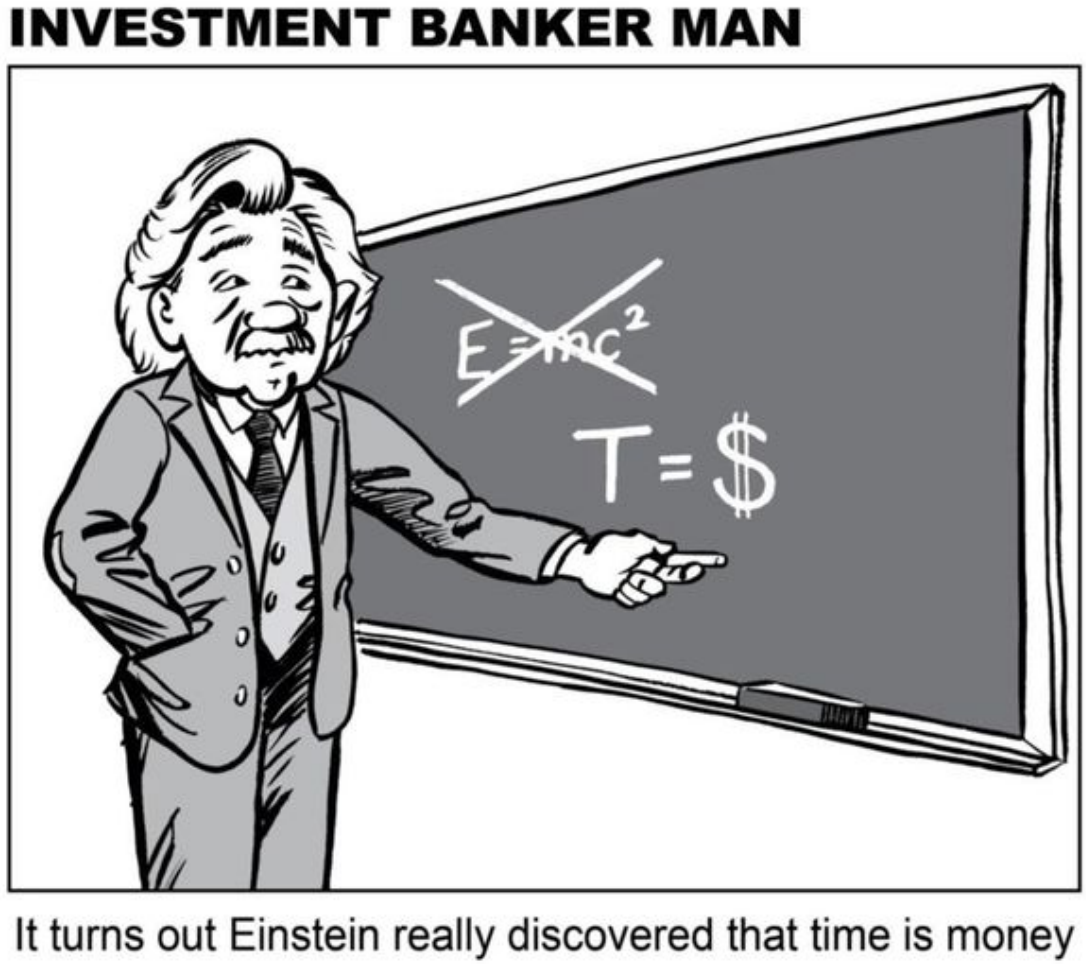

Image Credit: Rob Slee `https://twitter.com/timereallymoney/status/655419400124833794`

Lisa's Thrifty Savers savings account in Bart the Fink

Lisa put in \$100 for one year into a Thrifty Savers 2.3% savings account instead of a 2.25% account, and she earned an extra nickel. What equation represents this scenario?

$$.05 =$$

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$$.05 = 100(1 + \frac{.023}{n})^n - 100(1 + \frac{.0225}{n})^n$$

Benjamin Franklin's Financial Legacy

- time, rate, number of times compounded, human element
- lump sum is appropriate
- average earned rate
- Goal seek, Microsoft Excel
- real-life history

1. Hypothetical Situation: If the fund lent out half of its money at 5% to borrowers who all paid back their loans plus interest, but if the fund could not find any borrowers for the other half of the money (i.e. 0%), what would the average earned rate of the fund be (take the weighted average—half at 5% and half at 0%—your response is a rate, not a dollar amount)?

1. Hypothetical Situation: If the fund lent out half of its money at 5% to borrowers who all paid back their loans plus interest, but if the fund could not find any borrowers for the other half of the money (i.e. 0%), what would the average earned rate of the fund be (take the weighted average—half at 5% and half at 0%—your response is a rate, not a dollar amount)?
2. The fund lent some of its money to borrowers who didn't repay anything. How would that "rate" contribute in the calculation of the average earned rate?
   Circle one: negative 0 positive

ASULearn Engagement

- Our Constitution is in actual operation; everything appears to promise that it will last; but in this world nothing is certain but death and taxes.
  – Benjamin Franklin, Polymath and Founding Father
- It would be a hard government that should tax its people one-tenth part of their income.
  – Benjamin Franklin, *Poor Richard's Almanac*, 1758
- The only difference between a tax man and a taxidermist is that the taxidermist leaves the skin.
  – Mark Twain, Writer
- America is a land of taxation that was founded to avoid taxation.
  – Dr. Laurence J. Peter, Educator
- I like to pay taxes. It is purchasing civilization.
  – Oliver Wendell Holmes, United States Supreme Court Justice
- This [preparing my tax return] is too difficult for a mathematician. It takes a philosopher.
  – Albert Einstein, Theoretical Physicist