Precalculus: Compound Interest

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Let's play money making game

You are the winner of a game show, and you are given an option for your winnings.

- Option 1 is you get $1,000$ dollars every day for a month.
- Option 2 is you start with a promise of 1 dollar on day 1, which doubles on each day, up until the end of the month when you finally get your money.

Which option should you pick?

A more realistic example of compound interest

You have $1,000$ dollars in a savings account. Each year your bank pays you 3% compound interest. Assume you don't withdraw from your savings.

- How much will be in your account after 1 year?
- After 10 years?
- After t years?
- How long until you have $1,600$ dollars in your account?

A general formula

$$P(t) = P_0 \cdot (1 + r)^t$$

- $P(t)$ is the value after t time units.
- P_0 is the principal or initial value.
- r is the interest rate. Express this as a decimal or fraction, not a percentage.
- t is the number of time units.