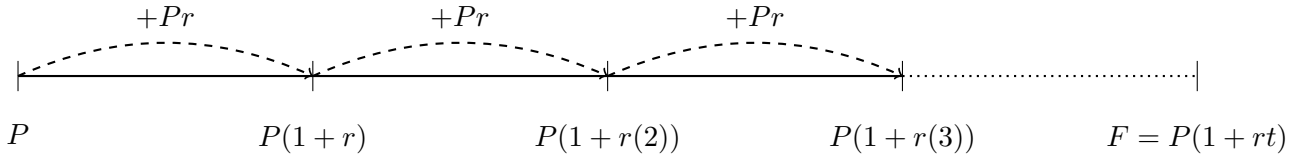


Section 6.1-6.2 Overview

Simple Interest

In a simple interest account, interest is only computed on the principal (interest is NOT compounded). That means that the amount of interest earned each year is the same. Here is a time line illustrating simple interest:



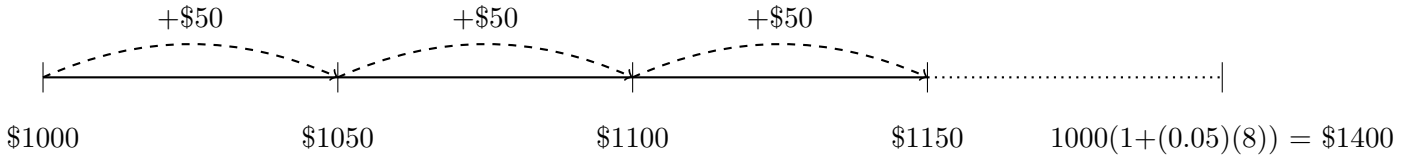
We observed the following patterns

$Pr =$ ‘the interest added each year’ and $Prt =$ ‘total interest added.’

$F = P + Prt$ which can be factored in written as $F = P(1 + rt)$.

Here is a quick example: You deposit \$1000 into an account paying 5% simple interest annually. What is the value in 8 years?

Answer: Note that $P = 1000$ and $r = 0.05$. Thus, the interest added each year is $Pr = 1000 \cdot 0.05 = \$50$. The time line would look like

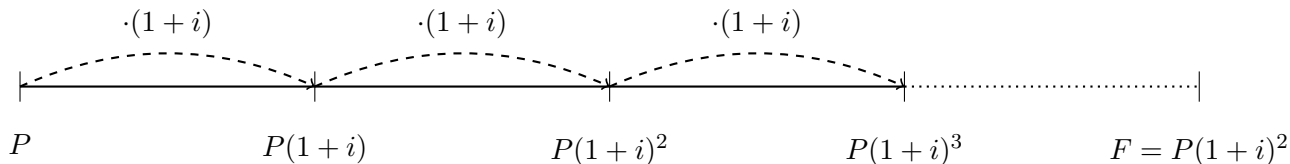


Tips:

1. Read the question carefully. Identify F , P , r and t . Then solve for the remaining unknown.
2. Remember to put t into years.
If months are given, then divide by 12. If days are given, then divide by 365.
3. When you are stuck, draw the number line as I have done. Notice if you already know the amount you are adding at each step (like in the last example it was \$50), then you can immediately write the formula:
 $F = 1000 + 50t$.

Compound Interest

In a compound interest account, interest is computed on the total balance (principal and any previous interest). Interest builds on itself. Here is a time line illustrating compound interest (in this illustrating we are compounding once each year):



We observed the following pattern

$$F = P(1+i)^n,$$

where

$n =$ ‘total number of compounding periods’, and $i =$ ‘decimal rate for each compounding period’.

When a bank says “decimal annual rate r , compounded m times a year”, they mean use $i = \frac{r}{m}$ and $n = mt$ which gives:

$$F = P \left(1 + \frac{r}{m} \right)^{mt}$$

When a bank says “decimal annual rate r , compounded continuously”, they mean use

$$F = Pe^{rt}$$

We also defined Annual Percenter Yield (APY), we found (use the appropriate formula for the type of account):

$$APY = \left[\left(1 + \frac{r}{m} \right)^m - 1 \right] \cdot 100\%, \quad \text{and} \quad APY = [e^r - 1] \cdot 100\%$$

Tips:

1. Read the question carefully. Identify F , P , r , m and t . Then solve for the remaining unknown.
2. You need to know how to use logarithms and roots to solve for the appropriate variables. We carefully went over this in lecture and did examples of each scenario, get the notes from a classmate if you missed.