

Closing Thurs: 6.1, 6.2
Exam 2 will be returned Tuesday.
Grade info will be up by Friday.

Remaining schedule

Today: 6.1 (Simple Interest)
11/30 (Wed): 6.2 (Compound Int.)
12/2 (Fri): 6.3 (Annuities: FV)
12/5 (Mon): 6.4 (Annuities: PV)
12/7 (Wed): 6.5 (Annuities: Loans)
12/9 (Fri): Review
12/10 (Sat): Final Exam

Final Exam Details

Saturday, December 10
Time: 5:00-7:50pm
Location: Kane Hall 130

Entry Task: (Motivation)
\$1000 is deposited in an account.
We call this the *principal*: $P = 1000$.

1. What is 20% of \$1000?
2. If 20% of the principal is added to the balance, what is the new balance?
3. If 20% of the *original principal* is added to the balance at the end of each year, what is the balance at the end of 4 years?
4. If 20% of the *entire balance* is added to the balance at the end of each year, what is the balance at the end of 4 years?

6.1 & 6.2 Preview - Lump Sums

A *lump sum* (called the *present value*, or *principal*) is deposited into an account today.

The account earns interest, but no other deposits are made.

Here are the main variables:

$P = PV =$ present (start) value

$F = FV =$ future (end) value

$I =$ total interest = $F - P$

$r =$ decimal interest rate,

$t =$ time

$m =$ num. of comp. periods per year

$n = mt =$ total num. of compoundings

Three types of lump sum accounts

1. Simple Interest (no compounding):

$$F = P + Prt$$

Compounding: $F = P (1+i)^n$

Two subtypes:

2. Compound n times/year:

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

3. Continuous compounding:

$$F = P e^{r t}$$

6.1 Simple Interest

When an account says it pays **simple interest** that means that interest is only calculated on the original principal. In other words, the same dollar amount is added to the account each year (interest is NOT compounding).

Example (Prob. 1 from homework):

You invest \$10,000 for 8 years into an account that pays 17% simple interest annually. Give the future value and the total interest.

6.1 Miscellaneous Homework:

(all 6.1 homework is simple interest!)

7. If \$5000 is invested at 9% annual simple interest, how long does it take to be worth \$8150?

$P =$, $t =$, $r =$, $F =$

10. Suppose you are offered a job with a relatively low starting salary but with a \$4000 raise for each of the next 12 years. How much more than your starting salary would you be making in the thirteenth year?

$P =$, $t =$, $r =$, $F =$

5. A student has a savings account earning 3% simple interest. She must pay \$1400 for first-semester tuition by September 1 and \$1400 for second-semester tuition by January 1. How much must she earn in the summer (by September 1) in order to pay the first-semester bill on time and still have the remainder of her summer earnings grow to \$1400 between September 1 and January 1?

8. A retailer owes a wholesaler \$500,000 due in 45 days. If the payment is 15 days late, there is a 1% penalty charge. The retailer can get a 45-day certificate of deposit (CD) paying 8% or a 60-day certificate paying 9%. Is it better to take the 45-day certificate and pay on time or to take the 60-day certificate and pay late with the penalty?

Note: $P = 500000$

(they have the \$500,000, now!)