

COMPOUND INTEREST

- Learning goals
- review new vocabulary
 - determine the difference between simple and compound interest
 - calculate compound interest

Principle
Interest
Loan
Investment
Simple interest

Compound Interest - \$500 invested at 12% compounded annually

Year	Principal	Interest Earned	Amount at the End of the Year
1	500	$500(0.12)=60$	560
2	560	$560(0.12)=67.2$	627.20
3	627.20	75.30	702.46
4	702.46	84.30	786.76
5	786.76	94.41	881.17
6	881.17	105.74	986.91
7	986.91	118.43	1105.34

Simple Interest gave us \$920

Compound Interest - interest is earned on the principle and on the interest already earned

Future Value - total amount after a certain period

$$A = P(1 + i)^n$$

amount in the future → A
 principal → P
 interest rate/compounding period → i
 number of compounding periods → n

Compounding Period

- annually $1x$ in a year
- semi-annually $2x$
- monthly $12x$
- bi-weekly $26x$
- weekly $52x$
- daily $365x$

ex. Joe invests \$5000 at 2% compounded monthly.
How much money will he have 5 years later?

$$\begin{aligned}
 A &= P \left(1 + i \right)^n \\
 &= 5000 \left(1 + \frac{0.02}{12} \right)^{5(12)} \\
 &= 5525.39
 \end{aligned}$$

\therefore he will have \$5525.39

Nathan borrows \$2000 at 8% compounded semi-annually for 3 years.

How much will he have to pay back at the end?

$$\begin{aligned}
 A &= P \left(1 + i \right)^n \\
 &= 2000 \left(1 + \frac{0.08}{2} \right)^{2(3)} \\
 &= 2530.64
 \end{aligned}$$

\therefore he has to pay back \$2530.64

On the Boards...

Michael invests \$10000 at 2% interest for 5 years.

He wants to know if he should do compounding weekly or monthly?

weekly

$$\begin{aligned}
 A &= 10000 \left(1 + \frac{0.02}{52} \right)^{5(52)} \\
 &= 11051.50
 \end{aligned}$$

monthly

$$\begin{aligned}
 A &= 10000 \left(1 + \frac{0.02}{12} \right)^{5(12)} \\
 &= 11050.79
 \end{aligned}$$

\therefore weekly is better

Jennifer owes \$1875.00 on her credit card. Visa charges 23% interest compounded daily. How much does she have to pay back if she is 15 days late with her payment?

$$A = 1875 \left(1 + \frac{0.23}{365} \right)^{15}$$

days

$$= 1892.8$$

\therefore she has to pay
back \$1892.80

Seatwork / Homework

pg 428 # 3, 4
432 # 4, 5