

What's Going On?

Checking In

Minds on

Present Value

Action!

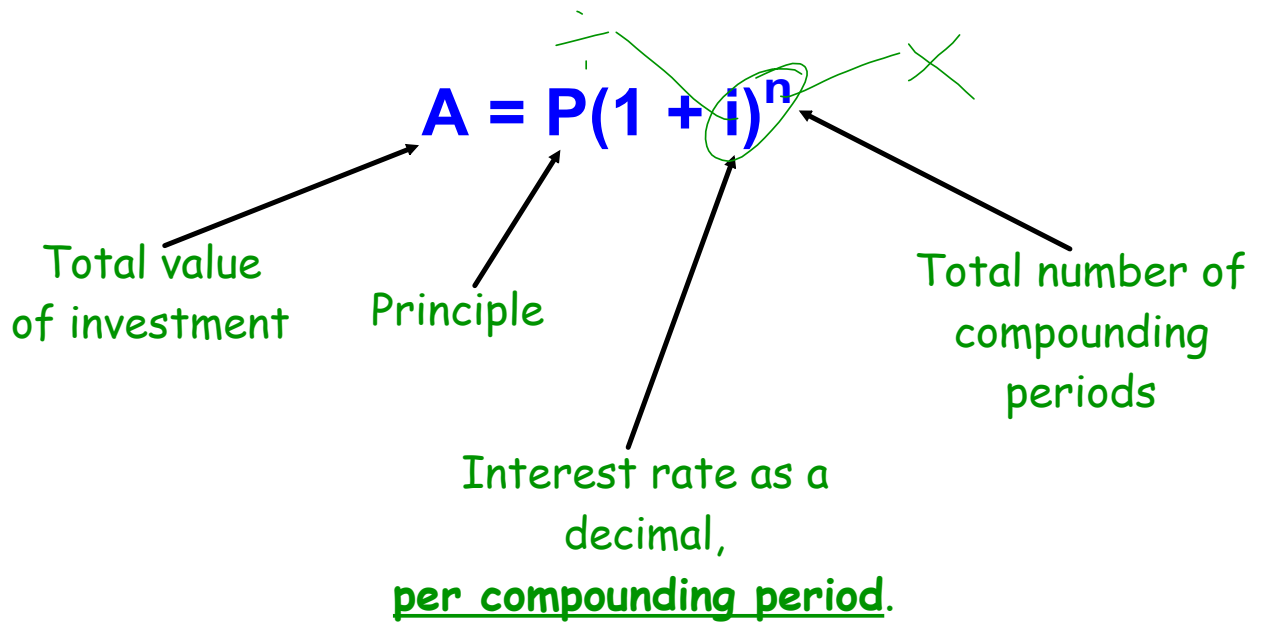
Present Value Formula

Consolidation

Minding Your i's and n's

Learning Goal - I will be able to solve present value problems involving compound interest.

The Compound Interest Formula



 **Minds on**

Present Value

Present Value

The principal that would have to be invested now to get a specific future value in a certain amount of time.

Minds on

Present Value

How much money would need to be invested now at a compound interest rate of 5% per year to be worth \$50,000 in 10 years?

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

$$\frac{50000}{(1+0.05)^{10}} = \frac{P(1+0.05)^{10}}{(1+0.05)^{10}}$$

$$P = 30,695.66$$

Action!

Present Value Formula

How much money would need to be invested now at a compound interest rate of $i\%$ per year to be worth $\$A$ in n years?

$$A = P(1+i)^n$$
$$\frac{A}{(1+i)^n} = \frac{P(1+i)^n}{(1+i)^n}$$

$$P = \frac{A}{(1+i)^n} \Rightarrow A \times (1+i)^{-n}$$

Consolidation

Rearranging

Tony is investing \$5000 that he would like to grow to at least \$50,000 by the time he retires in 40 years. What annual interest rate, compounded annually, will provide this?

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

$$\frac{50000}{5000} = \frac{5000(1+i)^{40}}{5000}$$

$$\sqrt[40]{10} = \sqrt[40]{(1+i)^{40}}$$

$$1.0593 = 1+i$$

$$-1$$

$$i = 0.0593$$

5.93%

Consolidation

Minding Your i's and n's

Monica wants to start a business and needs to borrow some money. Her bank will charge her 6.4% interest compounded quarterly. Monica wants to repay the loan in 5 years, but doesn't want the amount she pays back to be more than \$20,000. What is the maximum amount that she can borrow and how much interest will she pay if she doesn't pay anything back until the end of 5 years?

$$A = 20000$$

$$P = \frac{0.064}{4} (0.016)$$

$$* i = 4 \times 5 (20)$$

$$* 20000 = P(1 + 0.016)^{20}$$

$$P = \frac{20000}{1.016^{20}}$$

$$P = 14559.61$$

$$\begin{aligned} I &= A - P \\ &= 20000 - 14559.61 \\ &= 5440.19 \end{aligned}$$

Consolidation

Homework

Pg. 498

3, 5, 7, 8