

Compound Interest: Present Value

Present value refers to the amount of money needed to invest **today** (the present) so that you will obtain a particular amount in the **future**. In other words, if you know how much money you want to have in the future, how much should you invest today?

In the **compound interest formula** $A = P(1 + i)^n$, P represents the starting (principal) amount. If we rearrange this formula by solving for P we obtain the **Present Value formula**...

$$\begin{array}{l}
 A = P(1+i)^n \\
 \frac{A}{(1+i)^n} = P \\
 A(1+i)^{-n} = P
 \end{array}
 \begin{array}{l}
 \nearrow \\
 P = A(1+i)^{-n} \\
 \text{or} \\
 PV = FV(1+i)^{-n}
 \end{array}
 \quad \dots \text{where } PV \text{ stands for } \underline{\text{Present Value}}$$

Example 1: How much would you need to invest **today** into an account that pays 3.6%/a compounded **quarterly** if you wanted to have \$3000 in 5 years?

Example 2: An investment yields an average 9.5%/a. How much would you need to invest so that you are a millionaire in 25 years if the interest is compounded **monthly**?

How much **interest** would you earn? Hint: $I = A - P$ (or $I = FV - PV$)

Class work / Homework: pg 476 – 478 #1, 2, 4,6-12