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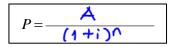
# PRESENT VALUE

#### RECAP

Simple Interest Formula	Compound Interest Formula	
I = Prt and $A = P + I$	$A = P(1+i)^n$	
I = interest earned D=Principal (\$ invested) r = interest rate in DECIMAL t = how long \$ invested (years) A= total amount	A = Total amount P = Pr.'ncipal i = interest rate per company period (DECIMAL) n = number of compounding period (e. Value (FV)	nding ks
Another word for $A = \text{Amount is}$ Fully P = Principal is Prese		

### **PRESENT VALUE FORMULA**

The compound interest formula  $A = P(1+i)^n$  can be rearranged to solve for **P** so that



or written with a negative exponent  $P = \lambda (1+i)^{-1}$ 

## **EXAMPLE 1: INVESTMENTS**

Ravi wants to invest enough money today to have \$5 500 for college tuition in two years. If he invests his money at 6% per year, compounded monthly, how much does he need to invest?

```
P = A(1+i)^{-n}
= 5500(1+0.06)<sup>-24</sup>
Type - compounded monthly
     - 5500
 A
     _?
 P
                                       = 135 8.38
, the needs to invest $1358.38.
     = 67./a = 0.06
 ı'
     - 2 years x 12-24
 n
```

#### **EXAMPLE 2: LOANS**

Suppose you want to borrow \$200. A creditor will add interest to the principal and then give you a loan for the full amount (interest included). You then make payments until the entire loan is paid off.

Jamie took out a \$3 000 loan, due in four years. If interest is 5.7% per year, compounded semi-annually, how much should Jamie's creditor be willing to accept to pay off the loan today?

Type = Semi-annually 
$$P = A(1+i)^{-n}$$
  
 $A = 3000$   $= 3000(1+0.0285)^{-8}$   
 $P = ?$   $= 2.396$   
 $i = 5.7\%/a = 2.85\% = 0.0285$ , The principal of the lonn  
 $n = 4$  years  $\times 2 = 8$   $i = 15 \pm 2.396$ .