Make Your Own Cheat Sheet

Each day this week (and next) I will start the period with a brief review of one our units, then you will complete a part of the culminating.

During this time, I encourage you to take note of things that you want to put on your cheat sheet.

Your cheat sheet will be an 8.5 x 11 sheet of paper (both sides) hand written. You can put whatever you want it! You will need all of our formulas. I recommend examples as well.

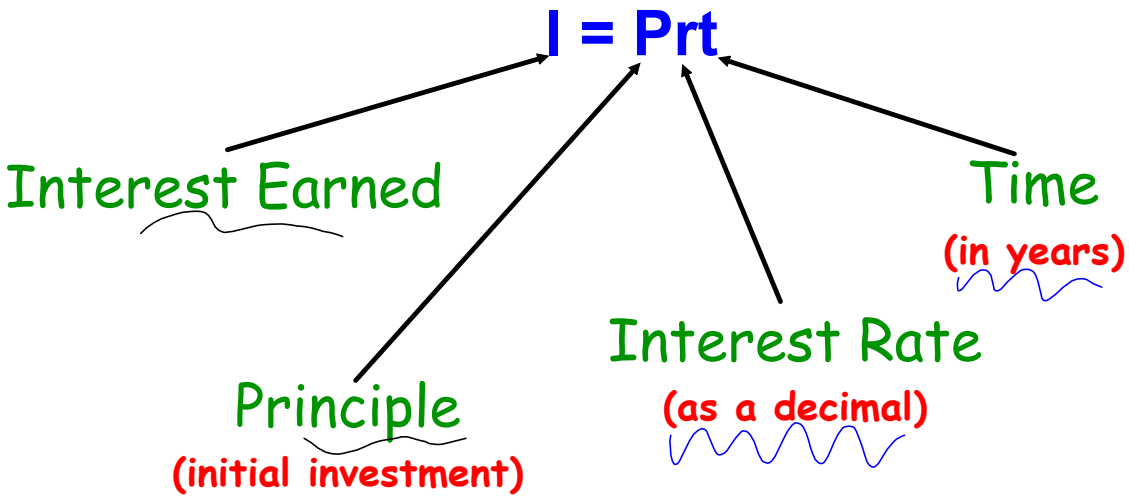
*We will not be RAFTing at the beginning of class, you can RAFT any day after you complete the task.

Personal Finance

1. Simple Interest

2. Compound Interest

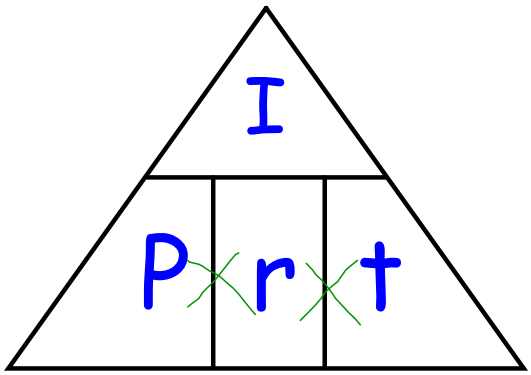
Simple Interest Formula



Simple Rearrangements

Simple Interest Formula

I = Prt



$$P = \frac{I}{(r \times t)}$$

$$r = \frac{I}{(P \times t)}$$

$$t = \frac{I}{(P \times r)}$$

How much interest will you earn if you invest $10,000 in an account earning 7.6% simple interest for 8 years?

I = ?

P = 10,000

r = 0.076

t = 8

$I = 10000 \times 0.076 \times 8$

$= 6,080$

You earn $6,080 in interest.

How much do you need to invest to earn $19,500 in interest over 15 years in an account that pays 6.5% simple interest?

I = 19,500

P = ?

r = 0.065

t = 15

$$P = \frac{I}{r \times t}$$

$$= \frac{19,500}{(0.065 \times 15)}$$

$$= 20,000$$

We must invest $20,000

What interest rate is required to double $25,000 in 20 years?

I = 25000

P = 25000

r = ?

t = 20

25000 doubles to 50000
(interest earned is 25000)

$$r = \frac{I}{P \times t}$$

$$= \frac{25000}{25000 \times 20}$$

$$= 0.05$$

5%

How long would it take to triple $15,000 in an account that earns 8.9% simple interest?

I = 30,000

P = 15000

r = 0.069

t = ?

triple 15000 ... 45000

interest earned = 30,000

$$t = \frac{I}{Pr}$$

$$= \frac{30,000}{15000 \times 0.069}$$

$$= 22.5 \text{ years}$$

The Compound Interest Formula

$$FV = PV(1 + i)^n$$

Final value of investment

Principle

Total number of compounding periods

Multiply number of compounding periods in a year by years of investment.

Interest rate as a decimal, **per compounding period**.

Divide interest rate by number of compounding periods in a year.

Determine the amount you will have if you invest $50,000 in an account that earns 6.2% interest compounded daily for 3 years.

365

FV = ?

PV = 50 000

$i = \frac{0.062}{365} = 0.00017$

n = 365 × 3 = 1095

$FV = 50{,}000(1.00017)^{1095}$

FV = 60,229.19

Solving for P

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

First plug everything in and evaluate $(1 + i)^n$

Then divide A by $(1 + i)^n$

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

I have found an investment account that pays 5.5% interest compounded quarterly. How much do I need to invest today to end up with $500,000 in 25 years?

FV = 500,000

PV = ?

$i = \frac{0.055}{4} = 0.014$

$n = 4 \times 25 = 100$

$$\frac{FV}{(1+i)^n} = \frac{PV(1+i)^n}{(1+i)^n}$$

$$PV = \frac{FV}{(1+i)^n}$$

$$PV = \frac{FV}{(1+i)^n}$$

$$= \frac{500000}{(1.014)^{100}}$$

$$= 124,501.46$$