**Compounded Interest**

Compounded interest is when the interest gained at the end of the year is added to the initial investment to produce even more capital the following year.

C(*t*) = Co (1 + *i*)*t*

C(*t*) = Capital after t amount of years

Co = Initial investment

i = interest rate compounded annually

t = number of years invested

Or

Y = Initial investment (1 + interest rate)t

**Example #1**

Todd invests a total of $2500 at an interest rate of 10% to be compounded annually. After 3 years, how much will be have made?

Y = Initial investment (1 + interest rate)t

Y = 2500 (1 + 10%)3

Y = 2500 (1 + 0.10)3

Y = 2500 (1.10)3

Y = 2500 (1.331)

Y = 3327.5

**Example #2**

Frank invests $1000 in a special account that pays 4% interest compounded annually. How many years would he have invested his money for the capital to be worth $1265.31?

Y = Initial investment (1 + interest rate)t

1265.31 = 1000 (1 + 4%)x

1265.31 = 1000 (1.04)x

1.26531 = (1.04)x

Log 1.04 1.26531 = x

= x

X = 5.99 or 6 years

**Example #3**

You received $9051 from a five-year Certificate of Deposit that offered a 2.5% rate of interest compounded yearly. What did your CD originally cost?

Y = Initial investment (1 + interest rate)t

9051 = x (1 + 2.5%)5

9051 = x (1.025)5

9051 = x(1.13)

8009.73 = x

**Example #4**

Sarah invests $500 towards her RRSP which earns her an annual interest rate compounded yearly. If after 7 years her investment was worth $751.81, what was the interest rate on her RRSP?

Y = Initial investment (1 + interest rate)t

751.81 = 500 (1 + x)7

1.50362 = (1 + x)7

= 1 + x

1.05999 = 1 + x

0.05999 = x

6% interest rate

**Example #5**

On January 1, 1990, Jacqueline deposited $1000 into bank *X* to earn interest at a rate of 5% per year compounded annually. On January 1, 2000, she transferred her account to bank *Y* to earn interest at the rate of 8% per year compounded annually. What was the balance in bank *Y* on January 1, 2010?