**Financial calculator review**

If you invest $100 today for one year at a 10% rate of return, how much money will you have one year from now?

Enter 1 10 ±100

N I/Y PV PMT FV

Solve for 110

Enter 1 10 ±100

N I/Y PV PMT FV

Solve for 110

You are spending $100 by investing it. You input that as a negative value using the “±” key. You are receiving $110 back at the end of one year. That is the positive value.

Positives and negatives are used to denote the direction of the cash flow. Generally you use a positive value to indicate a cash inflow and a negative value to indicate a cash outflow. All dollar amounts in this type of problem are, in actuality, positive values.

**Ordinary annuity present value**

You will receive $12,000 a year for the next ten years from a trust fund your grandmother is establishing.

What is this gift worth today at a 9% discount rate?



Enter 10 9 12,000

N I/Y PV PMT FV

Solve for -77,011.89

**Annuity due present value**

You are buying some land from your parents today. You agree to pay them $5,000 a year for six years. The first payment is due today.

What is the actual selling price of the land if your parents are only charging you 3% interest?



Enter 6 3 ±5,000BGN

N I/Y PV PMT FV

Solve for 27,898.54

**Ordinary annuity future value**

You are planning on investing $3,500 in the stock market every year for your retirement. You will make your first investment at the end of this year. The average rate of return you expect to earn is 7%.

How much money do you expect to have when you retire forty years from now?



Enter 40 7 ±3,500

N I/Y PV PMT FV

Solve for 698,722.89

**Annuity due future value**

Your parents are giving you $3,000 at the beginning of each year for four years. You are saving this money and earning a 2.5% rate of return on your savings.

How much money will you have at the end of the four years?



Enter 4 2.5 ±3,000BGN

N I/Y PV PMT FV

Solve for 12,768.99

**Annuity – annual payments**

You plan on retiring at age 60 and then living another 25 years. Your goal is to have $500,000 in your retirement savings on the day you retire and spend it all by the time you die. During your retirement, you expect to earn 5% on your savings.

How much money can you withdraw from your savings each year during your retirement if you withdraw the funds on the last day of each year?

What if you withdraw the money on the first day of each year?



Enter 25 5 ±500,000

N I/Y PV PMT FV

Solve for 35,476.23

Enter 25 5 ±500,000

N I/Y PV PMT FV

Solve for 33,786.88BGN

**Annuity – monthly payments**

You currently owe $3,780 on your credit card. You are not charging any more on the account. The interest rate is 1.5% per month.

How much do you have to pay each month if you want to have this bill paid off within two years?



Enter 2x12=24 1.5 3,780

N I/Y PV PMT FV

Solve for -188.71

**Annuity – quarterly payments**

Your company recently borrowed $12,000 to buy some office equipment. The financing terms call for eight equal quarterly payments. The interest rate is 10%.

What is the amount of each quarterly payment?



Enter 8 10%/4 12,000

N I/Y PV PMT FV

Solve for -1,673.61

**Annuity time periods**

You own a landscaping business. Your goal is to purchase a professional lawnmower costing $7,500. To do this, you are saving $2,000 a year. Your savings account pays 3% interest.

How long will you have to wait to buy the lawnmower if you want to pay cash for the purchase?



Enter 3 ±2,000 7,500

N I/Y PV PMT FV

Solve for 3.61

**Annuity interest rate**

You owe $1,000 on your credit card. At the end of each month you pay $20 towards the balance. You’ve been told that it will take you 99.11 months to pay off this account.

What annual interest rate are you paying?

Enter 99.11 1,000 ±20

N I/Y PV PMT FV

Solve for 18.9%/12

**Present value – uneven cash flows**

You are going to receive $500 one year from now, $700 two years from now and $1,200 three years from now.

What are these payments worth to you today at a 9% discount rate?



Enter 1 9 500

N I/Y PV PMT FV

Solve for - 458.716

Enter 2 9 700

N I/Y PV PMT FV

Solve for -589.176

Enter 3 9 1,200

N I/Y PV PMT FV

Solve for -926.620

Total PV = $458.716 + $589.176 + $926.620 = $1,974.512 ≅ $1,974.51

**Future value – uneven cash flows**

You have $500 in your investment account today. You are going to add the following amounts to this account:

End of year 1 $600

End of year 2 $700

End of year 3 $800

Assume you earn an 8% rate of return.

How much money will you have in your account three years from now?



Enter 3 8 ±500

N I/Y PV PMT FV

Solve for 629.86

Enter 2 8 ±600

N I/Y PV PMT FV

Solve 699.84

Enter 1 8 ±700

N I/Y PV PMT FV

Solve for 756.00

Total FV = $629.86 + $699.84 + $756.00 + $800.00 = $2,885.70

**Perpetuity present value**

You are establishing a trust fund to provide $100,000 in scholarships to college students each year in perpetuity.

How much money are you contributing to this trust if the discount rate is 8%?



**Effective annual rate**

You have a credit card with a quoted annual percentage rate of 17.9%. Interest is applied to your account monthly.

What is the effective annual rate?



Enter 17.9 12

NOM EFF C/Y

Solve for 19.44

**Continuous compounding**

What is the effective annual rate of 14.9% compounded continuously?



.149

2nd

ex

-1

=

.16067

Which is rounded to 16.07%

**Pure discount loan**

You are borrowing money today at a 9% interest rate. You will repay the loan in one lump sum payment of $5,000 two years from today.

How much are you borrowing today?



Enter 2 9 ±5,000

N I/Y PV PMT FV

Solve for 4,208.40

**Interest only loan**

You are borrowing $2,500 today for five years at a 7% rate of interest. This is an interest only loan with payments paid annually.

How much must you pay each year until this loan is repaid in full?



**Amortized loan**

You borrow $1,000 at 8% interest. This loan is being amortized over five years with payments being made annually.

What is the amount of each annual payment?



Enter 5 8 1,000

N I/Y PV PMT FV

Solve for -$250.46