Savings With Regular Deposits (Annuities)

MEL4E

(deposits)

We will now do some examples that demonstrate the power of compound interest. We will solve some realistic questions to give you an impression of the importance of saving money.

Saving as a Lifestyle

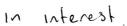
Example 2: If you put 10\$ away in a savings account **every week** for 50 years, how much money would you have in the end? You can assume that you get 2% compounded weekly on your investment.

- a) What is PpY and CpY if we deposit every week? 52
- b) How many weeks are in 50 years? $50 \times 52 = 2600$
- c) Solve for FV:
- d) How much money did you deposit in total over those 50 years?

1(%)	2
PV	0
Pmt	-10
FV	44,661,74
PpY	52
CpY.	52

2600

e) How much interest did you make? Are you surprised by this answer?

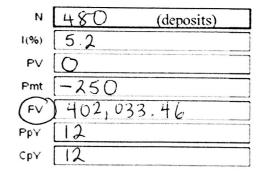




Saving for Retirement

Example 3: Jim invests \$250 every month into an RRSP (retirement savings plan). This plan pays 5.2% interest compounded monthly. How much money will Jim have when he retires in 40 years?

- a) What is PpY and CpY if we deposit every month? 12
- b) How many months are in 40 years? $40 \times 12 = 480$
- c) Solve for FV:



d) How much money did Jim deposit in total over those 40 years?

e) How much interest did Jim earn over those 40 years?

In interest



You can always count on your grandma to give you 100\$ at Christmas. Instead of spending that money, you decide that for 5 years starting next Christmas, you are going to deposit that money into a savings account at the end of the year.



If you could save the money in a bank account that pays 5% compounded annually, how much would you have after the 5 years? Complete the following table to find the future value:

Year	Starting Balance	Calculate the Interest	Ending Balance	Deposit	Ending Balance
1	\$ ○	× 1.05	\$ ○	+100	\$ 100
2	\$100	× 1.05	§105	¥1.05	\$205
3	\$205	× 1.05	\$215.25	¥1.05	\$315.25
4	\$315.25	× 1.05	\$331.01	¥1.05	8 431.01
5	8 431.01	× 1.05	§ 452.56	+100 -25.4.05	\$ 552.56

In general, we will use two ways to calculate the future value of a series of deposits:

● Use a **table** like above → Te

Use the TVM Solver

Example 1 (The TVM Solver):

The variables represent the following quantities.

Total number of payments N Annual interest rate as a percent **I%** Principal or present value Regular payment PMT FV Amount or future value Number of payments per year P/Y Number of compounding C/Y periods per year PMT: Indicates whether payments are made at the N 5 (deposits)

I(%) 5

PV 0

Pmt -100

FV 552.56

{ PpY 1

CpY 1

beginning or end of the payment period
The calculator displays either positive or negative values for PV,
PMT, and FV. Negative values indicate that money is paid out, while
positive values mean that money is received.

In annuity calculations, only one of the amount (FV) or present value (PV) is used. Enter 0 for the variable not used.