Business Mathematics: Chapter 8: Compound Interest Answer key by Michael Reimer

The reason we know this is compound interest is because of the following words:

Annual - Once a year = 1
Semi-Annual - Twice a year = 2
Quarterly - Four Times a year = 4
Monthly = Once a month = 12

Since it is compound interest we will be using the light grey row of buttons on your calculator. This is the third row down from the top.

N = Number of Payments - in chapter 8 this will represent the number of interest payments. To calculate N = yrs x Compounding

I/Y = Interest rate per year (%). Just use whatever % is given in the question. Do not change to a decimal.

PV = Present Value = Today's $, loan, intial investment, price and economic value.

PMT = Payments ($) - How big payments are, we will not use this function until chapter 10: Ordinary Annuities. = 0 when not in use.

FV = Future Value = Maturity Value

2nd I/Y to find the P/Y and C/Y

P/Y - Payments per year. In Chapter 8, P/Y = C/Y

C/Y - Compounding periods per year. Will be 1, 2, 4, 12.

When you get to P/Y you enter the # then hit the Enter button. If you do not hit the Enter button the number will not stay in the calculator. Once you hit the Enter button the C/Y will change to match the P/Y. After you hit the Enter button you should push the ↓ to check that P/Y = C/Y.

Once you are finished you hit 2nd CPT to leave this function. 2nd CPT Quit

Business Math: Chapter 8: Compound Interest Answer key (2)

by Michael Reimer

1) N = 15
I/Y 5.6
PV = ? = 9791.73
PMT 0
FV 10 500

2nd [P/Y 12 Enter ↓
I/Y [C/Y 12 2nd CPT to get out

Invested today means we are looking for PV.
Will be worth means FV.
5.6% = I/Y
per Month = 12 = C/Y = P/Y
15 months = N since time is in months and compounding is monthly $N = \frac{15}{12} \times 12 = 15$

To Enter the numbers in the buttons, you type the number first then hit the button.
So 15 [N], 5.6 [I/Y] 0 [PMT] 10 500 [FV]

- To compute PV, you first hit [CPT] then [PV]. You will get a negative in front of your answer, do not worry about the negative sign, just take the answer without the negative. $-9791.73 = 9791.73$
- Also, always round to 2 decimal places because we are dealing with money. Also, you may enter the numbers into the buttons in any order you wish. I just do it in the order that the buttons appear on the calculator.

2) N 15
I/Y 10.5
PV 5000
PMT 0
FV = ? = 22356.52

2nd [P/Y = 1 Enter ↓
I/Y [C/Y = 1 2nd CPT to get out

grow to = FV = ?
5000 = PV
10.5% = I/Y
Annually = C/Y = P/Y = 1
15 years x 1 = 15 = N

- If you made a mistake, you can check your numbers that you have already entered by using the recall function. So, [RCL] [N] [RCL] [I/Y] [RCL] [PV] [RCL] [PMT] [RCL] [FV]
- Also, if you want to erase the numbers that are in the buttons, you can push [2nd] [FV] CLR TVM, this will leave you with 0 for each button.

Business Math: Chapter 8: Compound Interest Answer Key
by Michael Reiner

3) ① N = $\frac{9}{12} \times 4 = 3$
I/Y 8.2
PV 500
PMT 0
FV ? 531.38

1) 2nd P/Y 4 Enter ↓
I/Y C/Y 4 ② 2nd CPT

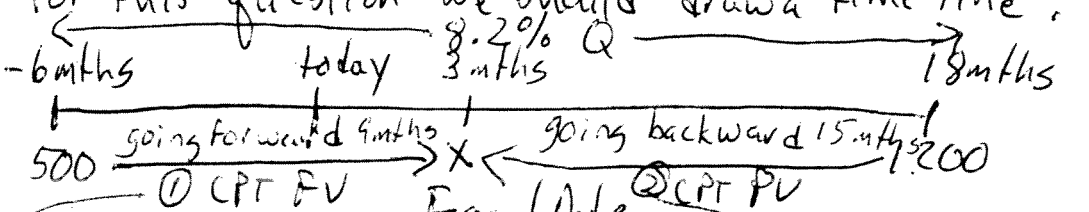
② N $\frac{15}{12} \times 4 = 5$
I/Y 8.2
PV = ? 1084.22
PMT 0
FV 1200

1) 2nd P/Y 4 ② Enter ↓
I/Y C/Y 4 ③ 2nd CPT

I am dividing the months by 12 to change into years.

③ Add both answers together:
531.38 + 1084.22 = 1615.60

For this question we should draw a time line.



Focal Date means this is the date we are going to be making the payments on.

① because the question says 6 months ago we are starting in the past. So we add 6 + 3 = 9 months

② because we are starting 18 months in the future and are going backwards we want to subtract = 18 - 3 = 15 months.

4) N 2yrs × 2 = 4
I/Y 9.3
PV 2000
PMT 0
FV = ? 2398.76

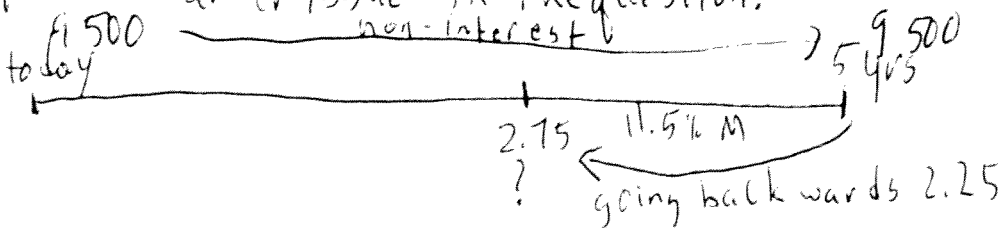
1) 2nd P/Y 2 Enter ↓
I/Y C/Y 2 ③ 2nd CPT

The question is asking for the amount of interest Sam has to pay on the loan.
To find Interest = FV - PV
So we need to find FV first, since loan = PV
Now subtract: $2398.76 - $2000 = $398.76

5) N 2.25 × 12 = 27
I/Y 11.5
PV = ? 7343.19
PMT 0
FV 9500

1) 2nd P/Y 12 ⑤ Enter ↓
I/Y C/Y 12 ⑥ 2nd CPT

A non-interest bearing promissory note means that, the amount that the note is worth today, is how much the note will be worth in the future. $9500 = FV
Also, we should draw a time line to figure out the time remaining because of the words "after issue" in the question.



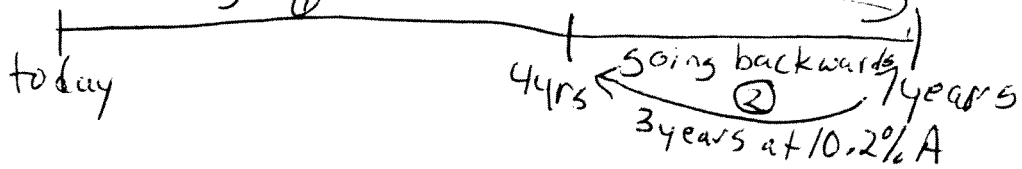
$\frac{33}{12} = 2.75$

6). N 10 yrs x 2 = 20
I/Y 6.1
PV = ? | 3708.19
PMT Ø
FV 25000
1) 2nd [P/Y 2 ② Enter ↓
I/Y [C/Y 2 ③ 2nd CPT

A strip bond is always going to be the FV amount and we are always computing PV unless given also in the question.
25000 = FV

7) ① N 7 x 4 = 28
I/Y 6.9
FV 4800
PMT Ø
FV = ? 7748.48
1) 2nd [P/Y 4 ② Enter ↓
I/Y [C/Y 4 ③ 2nd CPT

In this one we have an interest bearing promissory note. This means we first have to compute the FV of the promissory note and then secondly we use that FV and bring it back and compute the PV.
We should draw a time line to help us out.
4800 going forward at 6.9% Q



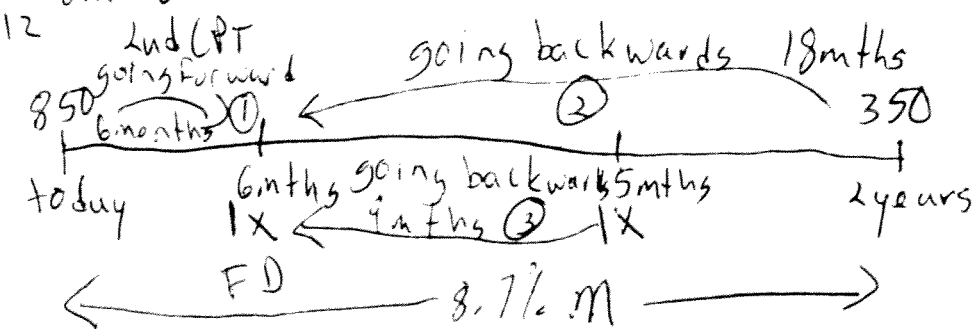
② N 3 x 1 = 3
I/Y 10.2
PV = ? 5789.91
PMT Ø
FV 7748.48
1) [P/Y 1 ② Enter ↓
I/Y [C/Y 1 ③ 2nd CPT

leave the whole number as is as FV

8) ① N 6/12 x 12 = 6
I/Y 8.1%
PV 850
PMT Ø
FV 887.65
1) 2nd [P/Y 12 Enter ↓
I/Y [C/Y 12 2nd CPT
② N 9/12 x 12 = 9
I/Y 8.7
PV ? 0.937053777
PMT Ø
FV 1
1) 2nd [P/Y 12 Enter ↓
I/Y [C/Y 12 2nd CPT

② N 18/12 x 12 = 18
I/Y 8.1
PV ? 301.32
PMT Ø
FV 350
1) 2nd [P/Y 12 Enter ↓
F/Y [C/Y 12 2nd CPT

① Let's draw a time line first.
② Pick a focal date. Pick one of the two unknown payments I am going to choose 6 months as my focal date.



8) continued

The next step is add up the 2 debts and make them equal to the 2 repayments.

$$387.65 + 301.32 = 1x + 0.937053777$$

$$\frac{1194.97}{1.937053777} = \frac{1.937053777x}{1.937053777}$$

Now divide by the # in front of the X

$$\boxed{X = 616.90}$$

So, Kevin would have to pay 616.90 in both 6 months and 15 months to wipe out both debts.