

# Chapter 12: Annuities Due Answer Key by Michael Reimer

## Business Math

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Annuities due means that the payments take place at the beginning of the period and not the end of the period.  
 So, this means that our calculators need to be in begin mode.  
 To change your calculator to begin mode:

**2nd** **PMT** BGN

It says END in the left corner to change modes you go **2nd** **Enter** Set and then your calculator will say BGN (begin) in the left corner. Also, a BGN will appear at the top of your calculator screen in the right corner. We will still use the row of bottoms to do our calculations.

①  $N = 25 \text{ yrs} \times 12 = 300$

$\pm I/Y 7.25$   
 $PV \ 0$   
 $PMT 350$   
 **$FV 296791.97$**   
 $P/Y 12$   
 $C/Y 12$

② Total paid =  $N \times PMT = 300 \times 350 = 105000$

Total =  $FV - \text{Total Paid} = 296791.97 - 105000$   
 Interest Paid  
**Total Interest = 191791.97**

③  $N = 5 \text{ yrs} \times 2 = 10$

$\pm I/Y 4.75$   
 **$PV 24055.73$**   
 $PMT 450$   
 $FV 0$   
 $P/Y 2$   
 $C/Y 4$

④ Total Paid =  $N \times PMT = 450 \times 10 = 4500$

Total =  $\text{Total Paid} - PV = 4500 - 4055.73$   
 Interest Paid

**Total Interest = 444.27**

⑤  $N = 15 \text{ yrs} \times 12 = 180$

$\pm I/Y 5.46$   
 $PV 500000$   
 **$PMT 74022.05$**   
 $FV 0$   
 $P/Y 12$   
 $C/Y 1$

Even though the word accumulated is being used in this question, the 500000 is a PV because we want to withdraw money from it beginning today.

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(2)

⑥  $N \ 15 \text{ yrs} \times 12 = 180$

$I/Y \ 2 \ 11.8 \ 1$

$PV \ 85000$

$PMT \ -1000$

$FV \ 0$

$P/Y \ 12$

$C/Y \ 12$

⑦  $N \ 83.44 \uparrow 84 \div 4 = 21 \text{ years}$

$I/Y \ 11.25$

$PV \ 0$

$PMT \ -1500$

$FV \ 500000$

$P/Y \ 4$

$C/Y \ 4$

This time accumulate is future value because the question is asking how long it takes him to accumulate to \$500,000.

⑧ This question will be done in end mode, but, every thing else is the same.

$N \ 84.34 \uparrow 85 \div 4 = 21.25$

$I/Y \ 11.25$

$PV \ 0$

$PMT \ -1500$

$FV \ 500000$

$P/Y \ 4$

$C/Y \ 4$

$$\begin{array}{r} -21 \\ \hline 0.25 \\ \times 12 \\ \hline 3 \text{ mths} \end{array}$$

21 years and 3 months