Certified General Accountants of British Columbia

FINANCIAL ACCOUNTING ASSETS - FA2

MODULE 5, INTEREST CONCEPTS OF FUTURE & PRESENT VALUES

MS. DALLAS: Welcome to the CGA Financial Accounting Assets, module 5, Interest concepts of future & present value, presented by Laura Dallas and Erin Creagh.

FA2, MODULE 5, PART 1, INTRODUCTION

You are now listening to Module 5, part 1, the introduction.

There will be five parts to this lecture. Part 2, is the Module Summary and Learning Objective; Part 3, Past Exam Analysis; Part 4, the Overview and Definitions Topics 5.1 – 5.2, and Part 5, will be topic 5.3 to 5.5. Note that topic 5.6 is a computer illustration and you will be doing that part on your own.

So welcome to interest calculations. This module will be one that either you love, because you already know how to do it, or it can be your worst nightmare if you haven't worked with interest and financial calculators before.

A quick overview of the module 5 topics are: the time value of money; basic interest

concepts; computing present and future values; periodic payments required for present value and future value problems; topic 5, computing the terms; and topic 6, the computer illustration.

There is not one specific calculator that students can use. Students can use any calculator they want, so trying to teach each student how to use their financial calculator and automatically getting the correct answer, can be a challenge in this format. You can purchase a financial calculator that you feel comfortable with, but make sure you know you really need a financial calculator and not a scientific calculator. Big differences and after you finish this module you will certainly know why.

At the CGA website, you will find a heading "Allowable Examination Room Materials and Calculators". I have cut and pasted here a sort of print screen what the window looks like, what you now want to go and find if you want to double check what I am going to tell you here. But basically students may use their own calculator in examinations, provided they meet the following guidelines: the calculator is

silent, battery operated and non-printing; the calculator has only one line of display, and the calculator does not have alpha keys. That means keys allowing text entry. That is very important.

Students are responsible for ensuring that the calculator batteries are fully operational. There will be no exchange or borrowing of calculators or batteries during the exam. And no operating instructions allowed in the exam room either. No other mechanical, electronic or other type of aid or material is permitted in the exam room.

You can bring in spare batteries just as you can bring in spare pencils and spare erasers. If you feel the need to you can bring in spare batteries for you calculator. And I have seen some students bring in two calculators one that's their financial calculator for doing all financial information, and sometime students will bring in a calculator that has big key pad numbers so they can quickly add something up if necessary. So, yes, you can have two calculators but they all must follow those rules about being silent and non-printing et cetera,

et cetera.

So hopefully you hear me quite clearly that I do highly recommend that you have financial calculator. You'll be able to automatically calculate the present value and the future value and the amounts. Yes, you can manually calculate it all if you know all the formulas and things like that but an investment in a good financial calculator will be an asset to you in further CGA courses, including the finance courses. But truthfully a good financial calculator can be an accountant's best friend. So get one that you like and that you can use well and feel confident using it well.

And of course remember that it is your responsibility to know how to use your calculator, and be prepared for the exam. The students that know how to use it and calculate the present values and things like that quickly just -- you don't have to spend time double guessing yourself, it's something you just want to know. And like I say it is in preparation for future courses.

In this module, the solutions to the numerical calculations are demonstrated using

the most common format of data entry for financial calculators. But the method of input could be slightly different across different brands and models of calculators. So you can look at your owner's manual for some specific instructions. Although those owner's manuals are almost like car manuals they're pretty detailed and pretty long. So I am certainly not meaning to scare you about these financial calculators, but if you know how to use it definitely a great asset for this exam.

Now some students who encounter little difficulty with interest and present value concepts, the reason they don't encounter difficulties, is most likely because they have taken a business math course, usually at a college level or they have taken a finance course. And I have taught the business math course at a college level and found that the successful students are the ones that know how to use their calculators. Some students like to just memorize all the formulas but you can't keep those with you forever. Honestly the students that get A's are the ones that know how to use their calculators. And some of you are

saying, "How difficult is it?" I am not just saying for adding and subtracting I'm saying I want you to know how to use it to calculate the present value.

And also if you need a refresher, there are many business math textbooks out there. You can see them at your local college bookstore, or even at your library. Or you can just use the same sort of website as the FA2 text. Just type in from McGraw Hill and college and you will find a list of quite a few textbooks listed there, and you will see certainly business math textbooks there.

If you do end up at that McGraw Hill website usually the first one you might see is the one called *Business Mathematics in Canada*, by Ernest Jerome. I have used that text before, I quite like it. And the nice thing about the publisher McGraw Hill is that the text websites are all set out in a similar fashion. So, if you use the text for the FA2 website, you will certainly be able to use up these business math tips from this website equally as well. And you might quite enjoy that. So have a look and see if you can find that. So you certainly don't

have to, like I say, as my job as a lecturer isn't to give you more information but for some students that need a brush up on their math skills this might be a way to do it.

And another extra, and again this is just an extra if you are struggling with your calculator or these kind of skills, I've got a website I will mention to you in a minute about an interactive calculator demonstration exercise. So if you are having trouble with your calculator, be sure to check it out. Or I am going to give you a specific one for the BAII plus, but I'll mention that one to you and you can find it and if that's not your calculator of course you could just Google your calculator and find it.

Now when I am teaching a business math class we actually go through the simple interest questions one step at a time looking at each button that we are going to push on the financial calculator until every student in the class has it. Sometimes it can take a while but it's a great exercise.

Actually there is a link directly from the McGraw Hill site and the business math in Canada

website directly to the Texas Instrument BAII plus calculator. And I have used that calculator, I do like it. Remember you can use any one on the exam that you want. And I strongly recommend not a particular brand, but I am recommending you need a financial one. I kind of laugh every time I see it somewhere saying, "Well, check your user's manual on the calculator," because the one I got, honestly it was about 40 pages long. So definitely check out your calculator's website.

I am just going to give you an example in the next couple of pages of what it looks like for the one that I found. I have known students that have come to me in class, they have got their financial calculator and they can't even change the decimal places. But once you've gone to this interactive website about your calculator you will actually know how to do it and you don't even stop to think, it is just as quick.

And I know I am kind of going on about this for a minute because many of you can just change anything on your phones and electronic gadgets in half a second so you shouldn't have a problem

with it, but those of you that are having a problem be sure to check out somewhere that you know how to use it well. Enough of that subject.

What else have I got for you here in this module for module 5? A few more introductory things. One thing is I've got lots of extra practice, multiple-choice in the hand out document, because one thing about present value, how you calculate it has not changed over the years. There has been a few different ways we can do it, whether we've been using formulas or whether you're using tables, but now the definite way to do it is from your calculator. So I have included lots of extra multiple-choice with you but they are from really old exams and they were calculated using tables, which means they only go to about 5 decimal places so they could be out just slightly. So just watch for that.

So again if you already know how to use your calculator present values is nothing, you won't even need to worry about it. But for those of you that this is something new or you're really rusty on, remember your best

friend is called practice, practice, practice. Doing the extra questions will give you the confidence so on exam day you'll be just flying through these questions. They will be the easy ones you look forward to.

I want you to visualize the exam day, take ten seconds out right now and visualize the exam day. You kind of have two choices here:
a) you're going to feel comfortable and confident because you've practiced, or
b) you are going to be stressed and panicking because you can't remember how to make the calculator work for you.

As I mentioned the best way to know for sure you know how to make your calculator work, practice, practice, practice.

Let's look ahead. Guess what after module 5 you are over halfway through. What's coming up in the balance of the course? Module 6 is current financial assets & current financial liabilities. You will have to use some of the concepts that you are learning in module 5 there. Module 7 is on inventory measurement, inventory valuation and cost of goods sold. Module 8, again we're going to be using this

financial calculator, investments and financial instruments. Module 9, is on property, plant and equipment and intangible capital assets, and module 10, on property, plant and equipment and intangibles focusing on depreciation, amortization and impairment.

You've got this little breather in module 5, and then just a few more concepts that somewhat fit together.

Okay, we are almost finished here for the introduction. I hope I didn't nag you too much on those things since some of you will find it helpful and off you go to check out your calculator.

Next. part 2 on the module summary and learning objectives. And at about 12, 13 minutes almost, this is the end of FA2, Module 5, Part 1 the introduction.

FA2, MODULE 5, PART 2, MODULE SUMMARY & LEARNING OBJECTIVES

MS. DALLAS: FA2, Module 5 Interest Concepts, Part 2 the module summary and learning objective which will take us from slide 27 to 38.

So the topics in module 5, an overview: the time value of money; basic interest concepts;

computing present and future values; the periodic payments required; computing the term, and then the computer illustration. It's not a huge module and they have just broken it into a lot of little pieces and grasping each one one at a time. You're going to find this one of the shorter modules for you to work through.

So the learning objectives, number 1, is to describe the concept of the time value of money; 2, describe the concept of interest including simple and compound interest, and effective and nominal rates of interest; and 3, compute the present and future value of a single payment, and an annuity, both ordinary and annuity due; and 4, compute the required periodic payments for a given present value or future value; 5, compute the number of periodic payments and the final payment required to eliminate a debt; and 6, design a worksheet to perform time value of money analysis.

So interest concepts. This module explains the fundamental concepts of interest and present value and future values. Ordinary annuities and annuities due are both explained. Valuation techniques, including the use of a financial

calculator and functions in Excel are demonstrated.

So the concept of the time value of money, a dollar today is worth more than a dollar received tomorrow because today's dollar can be invested to earn interest.

Simple and compound interest. Interest can be thought of as a rent charge for the use of money. Simple interest is calculated based on the principal amount owing only and not accrued interest. Simple interest is not very commonly used. Compound interest is calculated periodically and based on the principal amount owing plus any unpaid interest. So the interest compounds on itself.

A nominal rate is the stated rate of interest. An effective rate is the annual rate that you actually pay when the effects of compounding are considered. And those two concepts are easy to get mixed up but when we get to that section of the module notes I will make sure I clarify a bit more.

So to determine the future and present values of single payments and annuities, you can use the calculator method or the spreadsheet

method. And of course in the module summary they tell you to refer to the owner's manual of your financial calculator for specific instructions. And really you need to know the calculator method for the exam.

To calculate the regular payment required. Determining the regular payment to extinguish a debt by equal payments due at the end of each interest period and determine the regular payment required to accumulate a required future amount. A good example here is to say, if I want to retire with a million dollars how much do I have to save every month for the next so many years to do that? Great question.

And determine the regular payment required payable in advance, for an acquisition made on credit. All of these items have, they say, a regular payment meaning we want the same payment amounts. It's just the last payment amount that will be different.

And compute the number of periodic payments. Determining the number of full payments plus a smaller last payment that is required to extinguish a debt. In other words how many payments are you going to have to make

at a certain amount before you pay off the debt?

Well, as you can see module 5 is much shorter and quite a welcome relief for many of you. You do have that assignment to be working on for this module I believe, so you're going to be busy with that. It's kind of nice to have this as a slightly lighter module for many of you.

At about 5 minutes slide number 38, this is the end of FA2, module 5, part 2.

FA2, MODULE 5, PART 3, PAST EXAM ANALYSIS

MS. DALLAS: FA2, module 5, interest concepts of future and present value, part 3, the past exam analysis.

The exam blueprint indicates that 5 to 7 percent of the exam will be from module 5. Usually module 5 is covered in the format of a few multiple-choice questions, but occasionally a question with journal entries has shown up on the exam, as you need to know the debit and credit portion and then from module 5 you are going to need to know the calculations. Be prepared for those multiple-choice questions or even a small question on interest and present values.

When I say a small question, one of the really old questions I saw on it was way back in December 2004, and I really haven't seen one since then, and you won't have access to that old exam so I will let you know what I mean when I say they've got a small question on it, I think it is worth only 7 marks. But rather than put it in a multiple-choice question, they laid it out for you. The question is pretty clear: On January 1, a company obtained a loan of $250,000. The loan is to be paid in three equal installments including principal and compound interest at 8 percent. And the first payment is due at the end of the year. The required is to prepare an amortization schedule for the loan and round it to the nearest dollars, and then part (b) record the journal entry related to the payment made on December 31st.

Now we haven't seen this type of question for a while but it doesn't mean something like that won't come back up. But if you know the multiple choice well I don't think you will have a problem with this.

The examiner felt that the overall performance on the question was satisfactory;

although the individual results varied significantly. Now this leads me to believe that many students did well, but many students had no idea how to tackle the question.

I have included the solution for part A, the little schedule for you, and there are not exact columns you have to do, but normally if you are making an amortization schedule you'd have the date, the amount of the payment, what's the amount of the interest, so what's the total payments and what's the ending balance of the loan. And it's not like you have to memorize that, they wouldn't care if you had the order slightly out. When something is just a schedule it is not something that's actually a published document with your financial statements that has to be exact. So there is some flexibility when doing little schedules.

And the journal entry would be a debit to the interest expense, a debit to the loan payable and a credit to the cash. So that was about 4 maybe 5 marks for the schedule and 2 or 3 marks just for the journal entry.

Now sometimes, as I have shown from the June 2010 question (g), sometimes the question

will not be all just number calculating regarding module 5, it could be a bit theory based. Such as:

"If payments are changed from being made at the end of the month to the beginning of the month, which of the following would be true?

1) The future value of a series of payments would decrease.

2) The future value of a single payment would not change.

3) The present value would increase; or

4) The present value of a single payment would decrease."

Now, if I was doing this kind of question I would give myself a small little example. But again if we're making payments at the end of the month and we're changing it from the end to the beginning, which would be true? The correct answer is, three, the present value of a series of payments would increase.

And I look at the June 2010 question (h):

"Roman does not have any money saved for his retirement. He wants to retire in 10 years and he wants to have $100,000 saved

by that time. He thinks he is going to earn about 6 percent per year on his investments. How much must he contribute at the end of each year to achieve this goal?"

So that's a standard calculate the answer question. What is the amount? The correct answer is 1) $7,587 and I will show you the calculation for that in just a second.

So in this module what we are trying to do is either calculate the present value, calculate the future value, calculate the amounts of the payments.

So here's another example from June 2010 question (i).

"LIM is selling some drilling equipment and finally it received an offer. The purchaser would provide a down payment of $50,000 and make annual payments of $10,000 for six years, and the first payment is due in one year. What is the cash equivalent price of this offer, assuming the effective interest rate is 8 percent?"

In other words what are they really offering in

today's dollars?

And of course we would want that so we could compare it against somebody else that's got a pure cash offer for us. The answer is 2, and let me show you how in just a second.

I have got those answers laid out for you and basically when I say payment equals $10,000, "N equals 6," "I equals 8," "present value equals," you have to plug that in and calculate. You need to calculate the present value of all the amortization amount and add the $50,000 that they are going to pay you cash right now. So we are finding out what the stream of money that $10,000's worth plus add the $50,000 they just gave us, that's why the answer is $96,229 and not $46,229.

Notice these answers have all been rounded to whole dollars, if you did get some cents it probably means you did it correctly. Most of your calculators would be preset for 6 or 9 decimal places, which makes you have more accurate numbers, so good for you for that.

So if those questions slightly challenged you, good. You're going to go through the whole module and you're going to spend some time

learning the material first and then you will spend some time practicing. And then you will feel comfortable with it and you will be ready for the exam.

So this was just a quick little review of what kind of questions have been on the past exams, what can you expect and what you have to look for as you are going through the module. So at about 7 minutes, this is the end of part 3 on the past exam analysis.

FA2, MODULE 5, PART 4, OVERVIEW AND DEFINITIONS, AND TOPICS 5.1 AND 5.2 TIME VALUE OF MONEY and BASIC INTEREST CONCEPTS

MS. DALLAS: FA2, Module 5, Interest concepts, Part 4. This section will take us from slide 50 to 74 and covers a lot of interesting information on an overview of interest concepts, definitions, information about the calculator and then on to topic 5.1, the time value of money and 5.2 on basic interest concepts.

First thing I want you to make sure you note is about the required reading. It's actually not physically in the textbook and you need to get to that required reading. You have to click on the link and it is only available

online, and that link is at the beginning of topic number 1, 2 or 3. It is an appendix for chapter 8 from the textbook, but it is only online.

And it's actually not that long so if you really wanted to print it out, you can even save it to your hard drive or you can print it out or whatever suits you.

Now on slide 52 I have the abbreviations for most of the calculator terminology. "PV" stands for present value; "FV" for future value; "PMT" is the amount of the annuity payment; "I" is the interest rate per period; "N" is the number of periods. Notice it is not the number of years it is the number of periods. So for the present value, the future value, the payment, the interest or N, or a "?" you should be able to solve for any one of the desired values.

Also be aware that there is the BGN key, the begin key, and you need to set your calculator on that if you're using annuity due. But only if you are using an annuity due, and if you are trying to use -- do a regular annuity and your begin key is on, you're in begin mode

and you're going to get the wrong answers.

And a note of caution is you cannot just clear the calculator by pressing the calculator clear, you have to completely reset all of the entries for the values of N, I, PV, PMT and the future value. And there are certain ways to clear your calculator of that and you are going to have to look in the instruction manual if you're not aware of how to do it.

And the good thing is that it holds everything the same. Say we are trying to do something, you know, with $50,000 over 5 years at, let's say the interest rate is 8 percent or 10 percent or 12 percent. We can just go back in and change "I" and press the calculate button and it will do it. Then we change "I" again and do it. So it does the what if situation great. So that is why the calculator doesn't clear the memory for each one of them, unless there is a specific key -- I think you have press the function 2 key or something like that. So make sure you look at your calculator and know how to clear all those keys.

Another really important thing is called the cash flow. You have to enter the values

into the calculator correctly. Cash inflow is as plus, and cash outflow is a minus. So when you deposit $5,000 into the bank that's a negative, and you are thinking "What?" Well it is, it's out of your pocket. And then when you get the money back in the future it's going to be a positive. So you are going to have to use the plus/minus key for this. But basically the concept always is if the present value is minus then the future value is positive or visa versa. Because either we give the bank money and then later we get the money back from the bank or the bank gives us money and then we make payments back to the bank. But with the cash flow it is always a plus and a minus.

So again the underlying logic is that a present value represents what you would pay today, a cash outflow, to obtain a sum or sums of money in the future, the inflows. The future value is positive as the bank will give the money back to you, so then it's an inflow to you. We are not looking at outflows or inflows for the bank, we're looking at it for you. So outflows are negative; inflows are positive.

So money has a different value over time

because money can be put to work, and therefore it earns interest.

Let's look at a couple of definitions. For simple interest, it's calculated based on the original principal amount and not on any accrued interest. It just calculates the interest based on the original amount. And compound interest is calculated periodically and based on the original principal amount plus any unpaid interest that's been accrued since the beginning of the period. So it compounds.

The future value is the value that a stream of money will accumulate to in the future at a given compounded interest rate. And the present value is the value today of that stream of money to be received sometime in the future. For a single payment, the present value factor is always less than the future value factor, assuming positive interest growth rate. And that number there is sort of more important when you are using tables and stuff, and what we're trying to say, if we've got a certain amount of money ten years from now or five years from now, any point in the future it will be worth less than that now because the money is worth less

now, more in the future. So a thousand dollars in the future might be $970 today, so you can see that factor is less than one. It's like 97 percent so that's less than one. You don't have to totally know that but you have to remember that when you are going directions with the money.

And importantly the definition of an annuity. Annuity is a number of single payments of equal amounts. And annuity due is when the payment is made at the beginning of the period. And we will go through those details in a little bit.

FA2, MODULE 5, PART 4, TOPIC 5.1 TIME VALUE OF MONEY

So some hints I have about the time value of money. You always have to determine whether you're converting everything to the present value or to the future value. Unless otherwise directed, you should pretty much always be calculating to the present value. And determine whether you are given the future amounts or the present amount. So you have read the question carefully in those problem style formats. Is what they are telling you for the future or is it what's happening now?

And also determine are you given just a single amount or an annuity?

And then you have to perform the calculations to make the decision about the problem or the case.

I have a few other sort of little kind of rules. The longer the time to maturity, the greater the value. And also the opposite or conversely, the lesser the value of the present value for a given future value. Okay. So the longer it takes to maturity the more it is going to be worth at the end.

And the higher the rate of interest, the greater the future value will be as well. And the more frequent the compounding the greater the future value will be as well. So that means the longer the time, the higher the rate, the more frequent. Always the amount in the future will be more.

So there is sort of a relationship between the present value and the future value; that is the future value equals the present value times one plus "I" to the "N" factor. It can also be restated showing the present value.

So these formulas are the basis for the

above statements about the time value of money. I'm really not going to go over more of the formulas as I encourage you to use the calculator for everything, the financial calculator that is going to automatically calculate everything. But you definitely can always just use the formulas to go through it. It is not recommended, and also some students love to double-check their work by memorizing the formulas. If you've got extra time go ahead, but if not focus on your financial calculator.

FA2, MODULE 5, PART 4, TOPIC 5.2 SIMPLE INTEREST

So topic 5.2, simple interest is rarely used in business, so unless stated otherwise, all interest computations are to be calculated on a compound basis. And you would assume that the compounding period is annual, unless there is a specific comment to tell you otherwise. And that's general. We almost have that rule, law, in Canada, we always are stating interest in values that are compounded annually unless they tell you otherwise that it is not annual.

So the method of calculating interest refers to how often the interest is compounded.

So it's quite often to see lenders compounding interest on a basis or daily, weekly, month, semi-annually, or annually. But, like I said, always assume it's annual unless you are told otherwise.

And accountants are interested in the number of periods, not years, that the investment or loan is to be held for, and the interest rate per period. And this frequently requires converting the nominal rate per year to a more appropriate measure. So for comparative purposes, when we are trying to compare things, it is necessary to ensure that all nominal, the quoted rates of interest, are converted to the effective rate, what you actually pay or receive rates.

So be patient with yourself and almost write this down, and on slide 69 it's printed out there for you. That the interest rates are, quoted in the annual terms with the number of compounding periods. For instance 10 percent compounded quarterly. The quoted rate is known as the nominal rate. The rate that you actually pay when the effects of compounding are taken into rate is called the effective rate.

So for example, 10 percent compounded quarterly is really the effective rate of 10.38 percent. So the nominal rate versus the effective rate. The nominal rate of interest refers to the annual stated rate with compounding. The effective rate is the rate that you actually end up receiving or paying. So effectively how much? Where this is really important is say you have a credit card or something and they tell you it's only 2 percent per month. Well when you compound that out, it's really 28.8 percent per year I believe that one is. So it's really important to know what they are talking about on an annual basis.

And if you're trying to figure out some of these things on the calculator or your spreadsheet, the easier way to calculate rather than using the formula every time to switch between nominal to effective rates, is there are some built-in functions on your calculator or your spreadsheet to do it for you. So you might want to try and find those and make sure you know how to use that function on your calculator.

Like I said I almost feel kind of remiss

not showing you on your calculator, but if there is 10 of you out there I believe there's at least five different financial calculators. So we can't really do that, but we are telling you these are the important things you need to know, now figure out your calculator to do that.

So on slide 73 I have kind of made a little table for you. Supposing you want to invest $1,000 at 10 percent interest today, for 3 years. So at the end of year 1, you will have a $100 interest, so your total investment will be $1,100. So at the end of year 2, you're going to have a $110 interest, so you will have $1,210. So at the end of year 3, you will earn $121 interest, so you will now have $1,331. So the future value of $1,000 in three years at 10 percent is $1,331. Or you can say the present value, the PV of $1,331 three years from now at 10 percent is $1,000. So see you have to be able to go back and forth with these numbers.

And we will go into a little more detail of even going back and forth with the numbers, but even in -- if I told you we have $1,000 today and we want to have so much in the future how much do we have to put in per year, or how many

years are we going to have to put in for? That's what we will look at in the next part of the lecture.

So actually at 13 minutes, this is the end of FA2, Module5, Part 4, which was just the overview of the definitions for topic 5.1 and 5.2, and quite a bit of the real details are going to be in the next section coming up in topics 5.3 to 5.5.

So again at about 13 and a half minutes slide 74, this is the end of FA2, Module 5, Part 4.

FA2, MODULE 5, PART 5, TOPICS 5.3 TO 5.5, COMPUTING THE PRESENT AND FUTURE VALUES, THE PERIODIC PAYMENTS and CALCULATING THE TERM

MS. DALLAS: FA2, Module 5, Interest Concepts, Part 5. This section will take us from slide 75 to 102, and Topics 5.3 to 5.5 on computing the present and future values, the periodic payments, and calculating the term. This is the real meat and potatoes of this module.

FA2, MODULE 5, PART 5, TOPIC 5.3 COMPUTING PRESENT AND FUTURE VALUES

Topic 5.3. In Topic 5.3 please note, I have copied this directly from the module notes

because I want to make sure you hear it and see it, and are aware of it. It says:

> "While the required reading does illustrate the calculation of both present and future values, this topic limits the balance of the discussion to the calculation of present values, because these are what you are most likely to encounter. However, note that future values also are examinable."

So you have to be able to go from present values to future values or future values to present, and they usually are giving you the examples only calculating the present value.

So basically there's like three, maybe even more methods, for calculating the present value and future value. One is the table method; two, is the spreadsheet method; and three, is the calculator method. And you will most likely need to use the calculator method. In the past the tables were given, I am not sure for how long or if they are going to be given this year, actually I didn't read up on it. If you really want to be using tables make sure you follow up and call the CGA office and ask them, but I have

a feeling they are not supplied anymore because they are actually not part of the course content. And like I said I am not administrative so I am not going to really go there. The module notes don't discuss tables anymore, however it is briefly found in the required reading, sort of in the other sections that aren't referred to. So let's not count on those.

The spreadsheet method, well you're not going to be taking your computer into the exam so from the spreadsheet you can come up with formulas and if you want to memorize those you could, although I think it's silly. So you really want to be using your calculator.

And as I have said, most accountants nowadays rely heavily on the use of their financial calculator, notice not the scientific calculator, and you will be much more efficient and successful in your career if you become proficient with your calculator.

So annuity versus annuity due. It's from the required reading on page 397 where I picked up these definitions for you. Ordinary annuity is where the payment or receipt occurs at the

end of each interest compounding period. And an annuity due, the payment or the receipt occurs at the beginning of each compounding period. We call it an ordinary annuity. For instance a mortgage, all of those kinds of things, loans, they are all ordinary. That means your payment, they give you the money at the beginning of the month, your first payment is at the end of the month.

So there is a few underlying assumptions that you need to be aware of for annuities. The amount of each payment is the same throughout the entire stream of the annuity payments. And the payments are equally spaced. It can be monthly, quarterly or even annually. The interest rate is stable, that means it always the same. The periods used for compounding interest coincide with the payment period. In other words, it's annual payment, annual compounding. If any of these conditions does not exist, then you have to have a more -- it's more intense, the calculation, and it all has to be done manually.

Exhibit 5.3-1, shows the difference between an ordinary annuity and an annuity due.

Basically what the difference is is the timing of the payment. For the ordinary, the payment is at the end of the interest period, whereas the annuity due, the payment is at the beginning. And you can see this difference by comparing the timeline with the ordinary annuity and the three payments with the annuity due and the three payments.

For some students it is a whole lot easier once you visualize that picture of the time chart of it. It makes sense of what is going on there.

And example 5.3-2 and -3 – I have reproduced it on slide 82 and 83 here – but what's basically happening is for an ordinary annuity you would enter in the data. For "N" is 12, the payment is 2500, "I" is 4, and the present value would work out to be negative $23,462.68, when you've got your calculator in your financial mode and everything else has been cleared.

Now if you just changed one thing, and that one thing was you set your present value for an annuity due, you have to set it to the BGN mode. You really wouldn't even have to change any of the other numbers because they would all stay in

there and then you press compute for present value and you'd get $24,401. So if you pay at the beginning of the period it's more than the payments at the end of the period.

And the reason that would make sense is if you get the money at the beginning of the period you're earning interest during that period. Where as if you got the money at the end of the period you wouldn't have earned interest during that period.

So practice on your calculator. Make sure you can stick these two exact things in and come up with the exact amount of monies. Practice on your calculator. If I have a classroom, when I have done the business math I literally walk around and make the students all punch it in and I should be able to see the exact numbers, and it usually has more decimal places in it. And I want to have it exact and make sure we walk through it one step at a time, that we really do get these numbers. And honestly you are not ready to move on if you can't get these numbers.

And quite often I find what the problem is with some of the errors that are made is if they, the student, does not enter the plus or

the minus key correctly, or if you haven't cleared all the items to start. And sometimes there is this little key called the compounding frequency that gets all messed up and that could be a bit of the problem. So as I've said before in the other parts, is learn your calculator. Find a website for your specific calculator, try and find a tutorial for it and make sure you understand how your calculator works. It will make life so much easier for you.

And for those of you who need it, I have put extra practice questions with examples, how to enter it in your calculator, into the handouts.

And on slide 57 I've actually got it that it sort of, if you look at any of these textbooks that I picked up from the library on business math, they show you how to exactly put it in and then you use your calculator and you make sure you can get the exact right answer. So you might want to pause me for a second or have a look at slide 57 and print those out. And make sure you can get your calculator to get the exact numbers.

So for many of you this is completely just

a review. You are going through it, you've skimmed through the required reading, you know how to use your calculators, especially those people that work in banks or have taken business math courses before. It's just a refresher for you. So for you folks you are lucky on this one. For other students you may have to read it through two or three times. And as my usual words, practice.

FA2, MODULE 5, PART 5, TOPIC 5.4, PERIODIC PAYMENTS REQUIRED

So topic 5.4, is for the periodic payments required. Truthfully, you should be able to go backwards and forth and calculate any of the unknowns with the calculator.

I went through the definitions earlier but I've got it here on slide 90 again. Now most calculators come with the numbers or all of these little keys all on one line, present value, future value, payment, "I" or "N". What I am saying to you is that it doesn't matter which of the information you're given in the problem, you should be able to calculate any of the other ones. Any of those unknowns you should be able to calculate.

And truthfully, once you get a handle on it

you can go back and forth and change one thing and do what ifs and once you really understand it and understand how it works and when you've got to press the "enter" key and when you've got to press the "function 2" key or the "shift function key" or whatever it is on your calculator, once you know the rules you will be able to play the game and do a great job.

FA2, MODULE 5, PART 5, TOPIC 5.5, COMPUTING THE TERM

And again topic 5.5 is to calculate the term, but once you know how to do them either way you should be able to get your calculator to do the exact amount and calculate the terms for how long are you going to have to make these payments.

And the tricky part is figuring out what the last payment is, because the last payment is very unlikely to be the same as all the other payments. It really just doesn't work out that way. So it is very likely that on the exam you could find a multiple-choice question that says, "How do you calculate that last payment?" Be prepared.

Oh, I know, I remember from when I taught, like I said business math classes, many students

get really frustrated, ready to throw their calculator out the window, when they get "error," "error," "error" flashing across the screen, or sometimes they get little error numbers. The most common error that we found – and it is usually the student, it's not the calculator – is that what they do is enter the present and the future values both as positive numbers. Remember the logic again, cash flow out now, means a bigger cash flow in later. So that means one of the numbers has to be negative and one positive.

And if you are adding a payment into it you've got to make sure the payment number coincides with both of it as well otherwise you get wrong numbers. Okay, so the most common reason you will have an error, if you haven't got your plus/minus keys correct.

And so I also want to say good luck to you, for those of you who are using financial calculators for the first time. Be patient, don't give up, and practice until you are efficient with your calculator.

And also I want to tell you this is value added. The value you are adding to yourself by

knowing efficiently and correctly how to use your financial calculator is huge. In your personal life, for mortgages, for loans, in your business life, knowing your financial calculator is a must to be successful. And it really might just seem like a minor issue, but really, the confidence others will have in you because you know the calculator and you understand the value of money is very important.

One other thing I wanted to mention is the past exam solutions for the multiple choice answers, some of the older exams showed the factors from the tables, whereas the more recent exam show the calculator information. So the answers should be the same, except if you are doing an old, old exam again the factors were usually only six decimal places and our calculators are nine. So there could be just a slight variation there.

And like I always say, important, don't forget to do the self-test for module 5.

Question 1, of course is a computer question that will really help you learn some of these skills that you will use in the future, I am sure.

FA2, MODULE 5, PART 5, TOPIC 5.6, COMPUTER ILLUSTRATION

Again topic 5.6 is the computer illustration that will help you with that. And you're not going to get a question on the exam with a computer question, but you will have questions like this in your life and in your career, so you do want to use the computer and Excel for the interest calculations.

And also, very valuable in this self-test, there are about 25 multiple-choice questions. And then questions 3 to 7 are also excellent practice for your financial calculator, although they are given to you more as little problems, so you have to read and understand which is which. And where the problem comes is figuring out what's the present value, which one is the future value.

Also, I just remembered that, from the textbook website, I believe, there is also some multiple-choice questions there that you can use to do more practice.

And for some of you, it is only going to take you a few minutes to do each question, like you should be able to do the multiple-choice questions within three minutes. So you can

practice lots of them within an hour.

I like my quote that I have for you, and if you guys are seeing the quote flashing on your screen you know that that means I am almost finished talking and you get to start doing your practice.

> "What we hope to do with ease, we must learn first to do with diligence."

Meaning that you have to very carefully do it the first few times and then eventually it will become easy.

And the next one I've got for you is Albert Einstein:

> "Don't worry about your problems with mathematics; I assure you mine are greater."

As I said, Module 5 is definitely one of the shorter modules, you just have to practice doing the information. There are a few shorter key concepts that you have to learn, and learn your calculator and then it is just up to you to do some practicing.

So at slide 102 and about 14 minutes, this is the end of FA2, Module 5, Part 5.

(END OF FA2, MODULE 5, PART 5)