# MAT 1005 Video Interactions
Dr. Sarah

These are interactions in the interactive videos I created. In the interactive video, the video pauses, asks a question, and requires a response to proceed. To earn credit we watch the entire video and submit the correct answers via the green "Submit Answers" button at the very end of the video, the one that shows all the questions we have answered—we use the check feature on interactive questions in order to help and can redo the responses until they are correct.
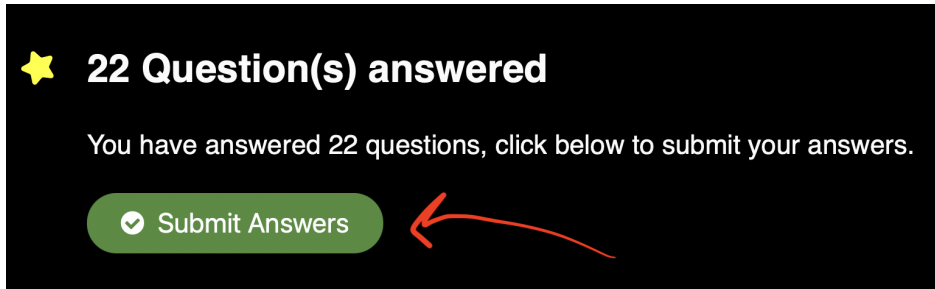
Each video includes directions to "pause regularly to take notes especially on formulas, concepts, examples, computations, visualizations, and any remaining questions." Above each video we include resources needed such as Excel files.

Contents

1005 intro and percents interactive video

- What should you call me in all communications?

- Is a growth mindset an important part of class?

- Open up course calendar above the video but still inside this activity and consider the deadlines and activities and assignments. You can open it in a new tab so you don't disrupt this video.

- Even through there are hard deadlines, where is flexibility built in to the course?

- How much time does the university expect you to study between each and every class you have?

- Where do we find the completion items and how do we know when they are completed?

- Do reading activities count as part of the ASULearn engagement grade?

- How do we earn completion for interactive videos?

- What are some of the features of the interactive videos?

- What order should items be completed and marked as done?

- What is repeatable about the practice quizzes?

- How is the second chance practice quiz after the deadline different than the original (also repeatable!) practice?

- Consider how you will create one PDF file of your handwrite responses to submit to the assignment in ASULearn

- Even with completion, you might have some aspects incorrect on handwrite practice. How can you tell what is incorrect on the handwrite?

- Consider the 3 handwrites and their due dates in the PDF calendar from above the video

- Which is a reasonable reply to a peer in a think-share-pair-compare

- For think-pair-share forum posts, I give good faith effort credit when you engage (rather than for correctness). How will you know what is correct or not?

- Consider the welcoming environment of this class

- Consider the grading percentages listed here and the deadlines on the PDF calendar.

- Consider the learning goals

- Open or turn on a calculator now. It can be a physical calculator or a calculator app as long as it can do powers

- Consider the technological requirements of the course.

- What is 8.5% as a decimal?

- Write down the definition of percent and how to convert from a decimal to percentage and back again.

- How would we compute the needed annual retirement income that is 80% of our final, pre-retirement income?

- How much should go into savings according to the 50-30-20 rule for a 1018 paycheck, the average weekly payment in NC in 2024 on ZipRecruiter?

- Write the debt-to-income ratio and the algebra to solve for the unknown income in your notes.

- Where can you go for help?

- What is some common advice from prior students?

lump sum interactive video

- Consider why $1000 at 5% interest compounding annually for 142 years is not $1000 \cdot 0.05 \cdot 142 + 1000$.

- Go ahead and try $1000(1 + .05)^{142}$ on a calculator.

- What is the formula when $1000 is compounded monthly at 5% for 142 years?

- Compute the compounding monthly formula on your calculator and at the same time consider which is better interest, compounding annually, monthly, or are they the same interest?

- Write the formulas for lump sum and interest in your notes. You may use letters, like P, n, r, an example with numbers, words indicating what the variables stand for, or a combination to help solidify the significance of variables for these formulas and as a reference to use later on.

- In your notes, sketch the graph and write down how debt-to-income ratios precipitated the 2008 recession.

- Which formula is correct if my real-life student's annual rate was 96% and $1000 was compounded monthly for 8 months?

  a) $1000(1 + .08)^8$

  b) $1000(1 + \frac{.08}{8})^8$

  c) $1000(1 + \frac{.08}{12})^{(8 \times 12)}$

  d) $1000(1 + \frac{.08}{12})^8$

  e) none of the above

- Write down the formula that the bank really meant and check you obtain 1054.59.

- Write the interest computation in your notes.

- Consider how any of the other items in the lump sum equation might be unknown if we know what we want our total earning to be.

- Write the lump sum formula with numbers filled in but leave the time unknown that would double 1000 deposited today to 2000 by compounding monthly with the unreal rate of 96%

- Consider how I typed in

  ```
  =1000*(1+.96/12)^b2
  ```

  in A2 and then used Goal Seek under Data/What-if-Analysis to set cell A2 to value 2000 by changing B2 to compute the time to double with the rate my student thought she had (but which wasn't a real-life savings rate).

- Consider that Federal Government regulations require that banks who accepts savings and deposit accounts state interest rates as annual interest rates along with the compounding period.

- First look a real-life rate for a CD today and write it in your notes. Then, if you have access, try today's rate in a desktop version of Excel on a computer. Above the video has an Excel file you can download to work in and instructions about obtaining your free copy of Excel. The internet version of Excel doesn't have Goal Seek in it but will be useful later when we do loans and you are working independently in the program.

- What is the exponent in the lump sum equation here for the future value (FV) to be $500 after 14 years of an account paying 1% compounded monthly?

- Solve on your calculator for the lump sum present value if we want the future value to be $500 after 14 years of an account paying 1% compounded monthly.

- In your notes, set up the lump sum formula with numbers plugged in for "a balance of 93 cents... and at an average of two and a quarter percent interest [that's compounded annually] over a period of 1000 years" and then solve for the total on a calculator.

- Solve on your calculator for the lump sum present value if we want the future value to be $500 after 14 years of an account paying 1% compounded monthly.

- In your notes, set up the lump sum formula for "a balance of 93 cents... and at an average of two and a quarter percent interest [that's compounded annually] over a period of 1000 years" with numbers plugged in and then solve for the total on a calculator.

- Consider the meme "Compound interest is the eighth wonder of the world. He who understands it earns it... He who doesn't... pays it..."

handwrite intro interactive video

- Look at the ideal deadline and final deadline in ASULearn as you open the PDF and decide whether you will write on it with a stylus, print and write on it to scan back in, or write on notepaper as you recreate the table and scan back in...

- Read the submission instructions, the goals, and "even the best-laid plans" section on page 1 and respond to the first 2 questions

- Consider how lump sum applies in this scenario and set up the lump sum formula with the rate unknown but all the other variables filled in

- Look at the (optional) Microsoft Excel link above the video and access the download link to view instructions and try to download it. If not you can work through this video for this handwrite only.

- If you have access to a desktop version of Excel or are working in a computer lab on campus with Excel, then download benf1.xls from above the video, but still inside this activity

- If you don't have access, read through the written instructions carefully to make sure you understand. If you have access, try this yourself. There are written instructions on the PDF for question #2

- Examine the filled-in row as you respond to #3 on the PDF. Skip the rest of the rows of the table for now

- Why do we need a new lump sum equation?

- What should the To value be here for the Goal Seek amount?

- Complete #4 on the handwrite PDF, which includes filling in the next row of the table back in question 3. Instructions are in the handwrite.

- Consider what is the lump sum equation that has $4444.44 growing to $172350.00 over 100 years with the average earned rate as unknown

- Do Philly's 1st hundred years in Excel if you have access. Instructions are in the handwrite.

- Consider what is the lump sum equation that has $39274 growing to $2256952.05 over 100 years with the average earned rate as unknown

- Do Philly's 2nd hundred years in Excel if you have access. Instructions are in the handwrite.

- Fill in the remaining rows in #3 on the PDF

periodic payment interactive video

- Consider the formula for the 2nd deposit of $100 put in at the end of month 2

- Consider the future value of each payment

- Consider the algebraic steps. What's left over?

- Calculate $59550.97 and write down what keys work on your calculator as you'll be using them in future practice and activities

- In your notes, write the formulas for periodic payment and the total interest for a periodic payment

- What algebraic operations did we use to derive periodic payment?

- Compare periodic payment for compounding monthly versus compounding annually

- Set up equations for $100 a month for 7 years at 1.75% compounded monthly switching to $175 a month for 5 years at the same rate

- Write these formulas in your notes and practice on your calculator to obtain the same responses

- Compute the total interest

- Compare the total interest to your calculation and make any corrections.

- Consider this decision. Would you take an annuity, an annual payout over 40 years, or the present value as a lump sum? This is a personal preference

- What would we use for a situation where a person deposits money in an account for 10 years but then spends that money elsewhere afterwards?

- Write down the lump, periodic and interest formulas as well as when they apply.

- Which formula represents the total when $25 is deposited each month for 8 months at 1% compounded monthly?

- Practice d on your calculator

- In your notes, write a scenario for a) and a scenario for b)

- Calculate a) and b) on your calculator and also consider the total interest too.

- Write down the interest calculations.

loan interactive video

- In the real-life rates assignment, consider that the loan rates are higher than the savings rates. That's one way of factoring in risk

- Consider the algebraic steps and final formula for the loan repayment at bottom.

- In your notes, write the formulas for the loan payment formula, the total paid, total interest, and monthly interest

- Consider which you would have selected. The graduated repayment plan was to cost me $7607.78 while the level payment plan was to cost me $6980.97

- Which choice do you think the loan company make for me? I recommend deciding yourself rather than leaving it to the loan company though!

- In your notes, write down the level payment plan details including the last payment of 57.55

- Calculate using the loan payment formula and write down the keys that worked for you to obtain 58.1766..., perhaps something like

  ```
  4795*.08/12/(1-(1+.08/12)^(-120))
  ```

- Write the amortization formulas in your notes and compute row 2 in your notes.

- Compare your row 2 with mine

- Open up studentloan.xlsx from above the video in Excel. This amortization table will work in both the online version of Excel as well as desktop version. The idea of working along with me is to gain some familiarity, with my help, before working independently in the upcoming car handwrite and in part 1 of the final project

- Explore the amortization table yourself by looking at the formulas in the formula bar and change B3 to the number 58.18 rather than Excel's formula in B3. Again, the file is above the video and you can open it on a desktop or open it in the web version of Excel as both will work for what we need here. Scroll down to month 120 when we finish paying off the loan. What is the loan balance now that we've modified B3?

- Change the Excel box B3 to read 83.18. Scroll down to see what month has the first time we have a 0 or negative balance in the E column?

- Write down how to calculate the total interest now and select which is the total interest

- Notice that the total interest now is 73*83.18-.56-4795 = 1276.58 because we pay 83.18 for 73 months, with an overbalance .56, and original loan of 4795. By paying an extra 25 each month, we save quite a lot of interest, paying 1276.58 in interest versus 2185.87

- Consider the difference in the loan calculator and Excel for month 73 of the paying extra scenario

- Write down the formulas as well as when they apply

- Set up the loan payment formula for a loan of 2450 at 6.92% compounded monthly that results in a $50 payment but with the time unknown but do not calculate

- Write down how the finance charge is computed and multiply those together

- What is the annual rate on the Payday loan?

think-share-pair-compare + final project interactive video

- Which is a reasonable reply to a peer in a think-share-pair-compare?

- For think-pair-share forum posts, I give good faith effort credit when you engage (rather than for correctness). How will you know what is correct or not?

- Read through the "follow up on the car amortization" and "future finances after graduation" prompts in the PDF for the final project above this video.

- Read through the creativity and persistence prompts in the PDF and consider whether you will select creativity or persistence for this component of your video. Ready to proceed.

- Finish reading through the five components for your final project video in the PDF

- Read through the peer review and self-evaluation questions in the final project PDF

- Read through the rubric in the final project PDF. If you have questions on the project, I can help in help hours or the need help forum.