# 4. INTERMEDIATE EXCEL

Winter 2019

# Problem 4.1

- Import and format:
  - zeus.cs.pacificu.edu/chadd/cs130w17/Problem41.html

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Item # | Product | Price | After Discount A | After Discount B |
| 2 | 125A | Scooter | $55.99 | $50.39 | $44.79 |
| 3 | 789A | Tricycle | $129.95 | $116.96 | $103.96 |
| 4 | 78B | Soccer Ball | $12.99 | $11.69 | $10.39 |
| 5 | 489B | Baby Doll | $12.99 | $11.69 | $10.39 |
| 6 | 57B | Art Kit | $14.95 | $13.46 | $11.96 |
| 7 | | | | | |
| 8 | Discounts | | | | |
| 9 | A | B | | | |
| 10 | 10% | 20% | | | |

- For the above worksheet, write a formula in the highlighted cell in such a way that you can fill down and then across to calculate the other prices.

# Debug Your Worksheet

- Go to the Formulas tab
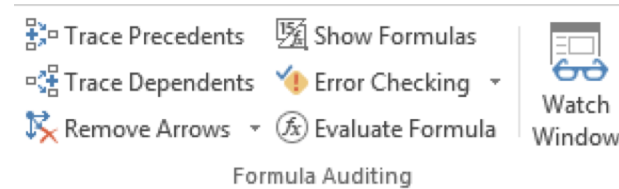
- Select cell D2 and use "Trace Precedents" to see which cells are used by cell D2.

- Select cell B10 and use "Trace Dependents" to see which cells use B10.

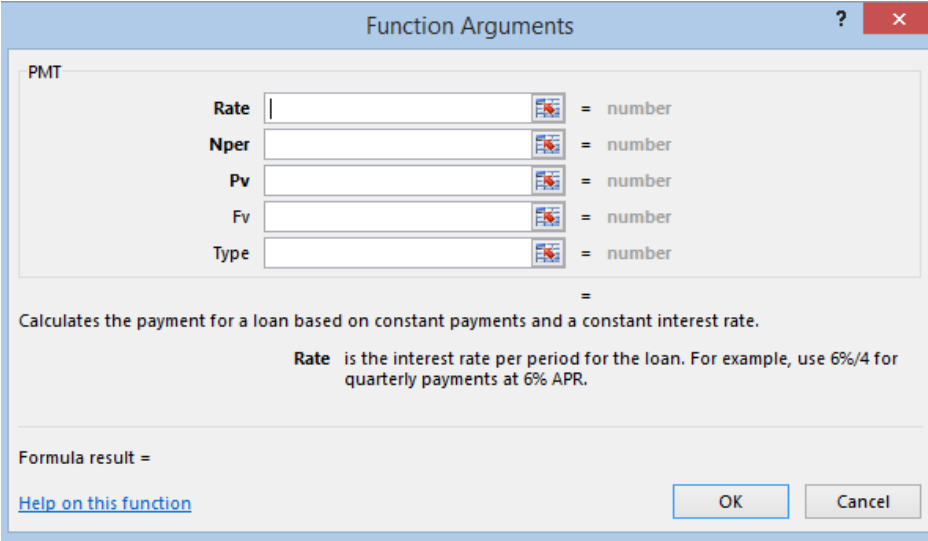- Click "Remove Arrows" to remove the tracing lines at any given time.

# Variety of Functions

- Excel has over 350 built-in functions divided into related categories.
- To invoke the "Paste Function" dialog box, click on the $f_x$ icon on the tool bar.
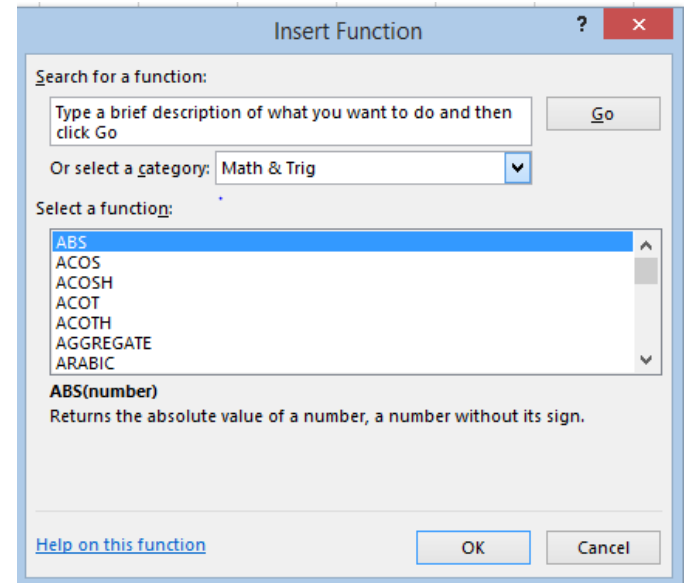
# Financial Built-in Functions

- The financial functions can be isolated in Excel. Simply go to the Function Library on the Formulas tab and select Financial.

- PMT Function

# PMT Function

- The PMT function calculates the payment for a loan based on constant payments and a constant interest rate

- Syntax is PMT(rate,nper,pv,fv,type) where
    - rate              is the interest rate for the loan
    - nper              is the total number of payments for the loan
    - pv                is the present value (principal)
    - fv                is the future value (usually zero)
    - type              indicates when payments are due
                              0 = end of month = default
                              1 = beginning of month

# PMT Function Continued

- Remarks
  - The payment returned by PMT includes principal and interest
  - Taxes & fees are not included

  - Units must be consistent between rate and nper
    - **Monthly** payments means
      rate = annual interest rate **/ 12**

# PMT Function Continued

- Examples
  - The following formula returns the monthly payment on a $10,000 loan at an annual rate of 8 percent that you must pay off in 10 months:
    - ➢ =PMT(8%/12, 10, 10000) equals -$1,037.03

  - For the same loan, if payments are due at the beginning of the period, the payment is:
    - ➢ =PMT(8%/12, 10, 10000, 0, 1) equals -$1,030.16

Why?

# PMT Function Continued

- What do these mean?
    - =PMT(12%/12, 5, -5000)          = $1,030.20


    - =PMT(6%/12, 18*12, 0, 50000) = -$129.08

# Problem 4.2

- Now, let's imagine that you want to purchase a car worth $29,899. The car dealer is ready to grant you a 5-year loan at 6.5% annual interest rate, but you must put down 10% of the car price as down payment.

- Design an Excel spreadsheet to allow the user the ability to input:
  - (a)The price of the car, (b)The yearly interest rate, (c)The length of the loan in years

- Your spreadsheet should then compute and display:
  - (d)The amount of the down payment, (e) The amount of the loan , (f) The monthly payment of the loan

-  Be sure to Define a Name for each of the input cells appropriately.

# Problem 4.2 Continued

- Once you get the above worksheet working, add a row that shows the total interest paid.

| | A | B | C |
|---|---|---|---|
| 1 | Car Loan | | |
| 2 | | | |
| 3 | Enter Car Price | | |
| 4 | Enter Yearly Interest Rate | | |
| 5 | Enter Time in Years | | |
| 6 | | | |
| 7 | Down Payment Is | | |
| 8 | Loan Amount Is | | |
| 9 | Monthly Payment Is | | |

# Problem 4.2 Continued

- Add a payment schedule to your current worksheet with columns: Payment #, Starting Balance, Monthly Payment, Monthly Interest, and Ending Balance.

| Payment # | Starting Balance | Monthly Payment | Interest | Ending Balance |
|---|---|---|---|---|
| 1 | $26,909.10 | $526.51 | $145.76 | $26,528.35 |
| 2 | $26,528.35 | $526.51 | $143.70 | $26,145.54 |
| 3 | $26,145.54 | $526.51 | $141.62 | $25,760.65 |
| 4 | $25,760.65 | $526.51 | $139.54 | $25,373.68 |
| .. | …. | …. | …. | ….. |

# Problem 4.2 Continued

- How can you be sure that your payment schedule is correct?

- Change the interest rate to 6%. Does your worksheet update correctly?

# Goal Seek Question

How much car can I afford if I am willing to pay $600 a month under the initial scenario?
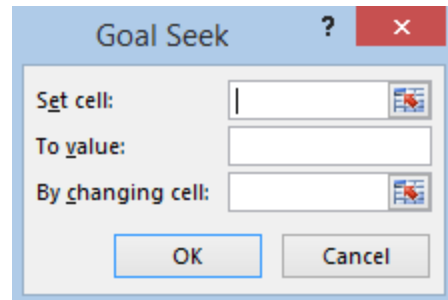
# Problem 4.3

- Go back to the worldometers.info page

- Check New book titles

- How many total books have been published this year?

- How many books have been published per day this year?

- Build a table showing the total number of books that will be published for each day of this year (given the growth rate above)

# Example

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Number of books published per day | | | |
| 2 | 6,519 | | | |
| 3 | | | | |
| 4 | Day of Year | Date | Total Book Sold to this date | |
| 5 | 1 | 1/1/2016 | 6,519 | |
| 6 | 2 | 1/2/2016 | 13,038 | |
| 7 | 3 | 1/3/2016 | 19,557 | |
| 8 | 4 | 1/4/2016 | 26,077 | |
| 9 | 5 | 1/5/2016 | 32,596 | |
| 10 | 6 | 1/6/2016 | 39,115 | |

These numbers are made up and don't reflect the current values from Worldometers!

# Freeze Panes

- Freezing panes is a useful technique for keeping an area of a worksheet visible while you scroll to another area of the worksheet.

- Excel displays think black lines to indicate frozen rows and/or columns.

- Select **View->Freeze Panes->Freeze Panes**

- Excel will freeze the panes at the location of the highlighted cell.

- To unfreeze panes, select: **View->Freeze Panes-> Unfreeze Panes**
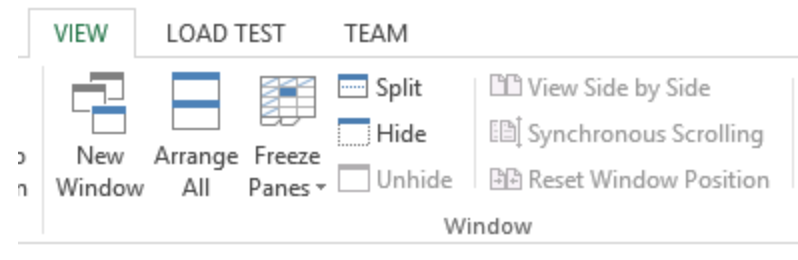
# Splitting the Workbook Window

- You can split the workbook window into two or four resizable panes, all with independent scroll bars

- Go to View->Split

# Outside Practice

- You want to buy a car for $10,000. You have $2,000 for a down payment and can get a 5 year loan with a yearly interest rate of 5.6%

- Build a spreadsheet that will allow you to input the cost of the car, down payment, and interest rate.

- The spreadsheet should determine the monthly payment and the total amount of money paid for the car over the 5 years (including interest).

- Use Goal Seek to determine what your down payment needs to be for your monthly payment to be $150

# Outside Practice

- You want to start funding your retirement account and hope to have saved $1,500,000 in 40 years.

- If you can achieve a 7% yearly interest rate with your retirement account, what does your monthly payment need to be to reach your goal?

- What yearly interest rate would you need to reach your goal if you could only save $450 a month? Show your answer to two digits past the decimal point.