



# Intermediate Excel

Winter 2011

# Combination Cell References

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- How do \$A1 and A\$1 differ from \$A\$1?

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
1	4	8	=A1/\$A\$3		
2	6	4	=A\$1*\$B4+B2		
3	=A1+A2	1			
4					
5					

- What formula would result in cell D1 if you copy the formula from cell C1 to D1?
- What formula would result in cell E5 if you copy the formula from C2 to E5?

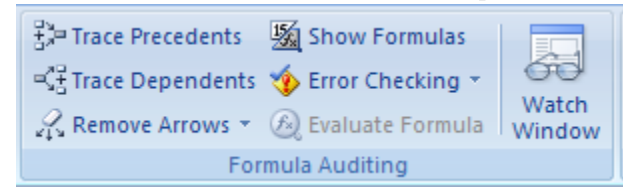
# Problem 4.1

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
1	<b>Item #</b>	<b>Product</b>	<b>Price</b>	<b>After Discount A</b>	<b>After Discount B</b>
2	125A	Scooter	\$59.99		
3	789A	Tricycle	\$129.95		
4	78B	Soccer Ball	\$12.35		
5	489A	Crybaby Doll	\$21.99		
6	57B	Art Kit	\$14.95		
7					
8	<b>Discounts</b>				
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

- Select cell D2 and use “Trace Precedents” in the Formulas Tab 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.

# More Excel Functions

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- In general, Excel functions take the form: `name(arg1, arg2,...)` where the number of arguments depends on the function being used.

Find a function in the Math & Trig library that uses two arguments. Show how the function works.

# Range of Cell Values

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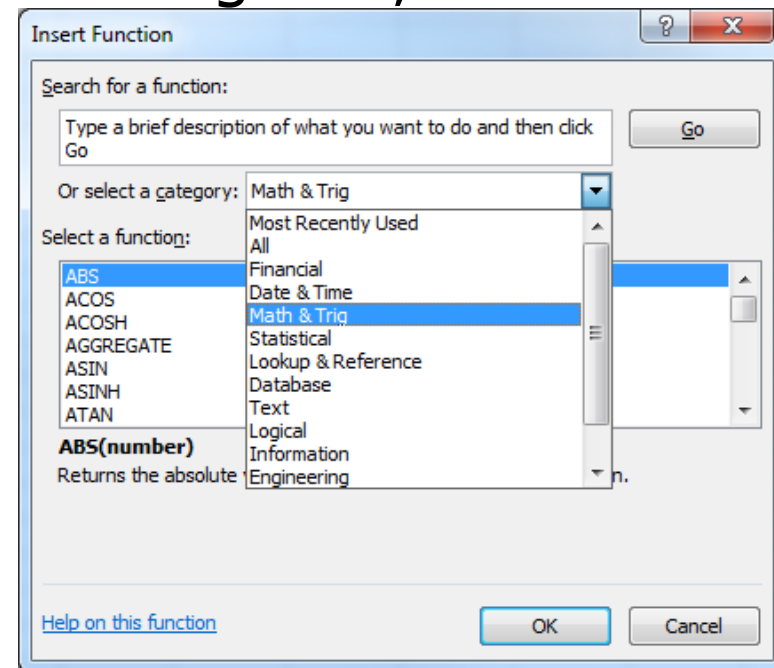
- The : between cell references indicates a range of values inclusive. So, A1:A5 means include cells A1, A2, A3, A4, A5.

Any ideas how we might rewrite the formula  
`=A1+A2+A3+A4+A5`

- Excel is not case-sensitive. What does this mean?

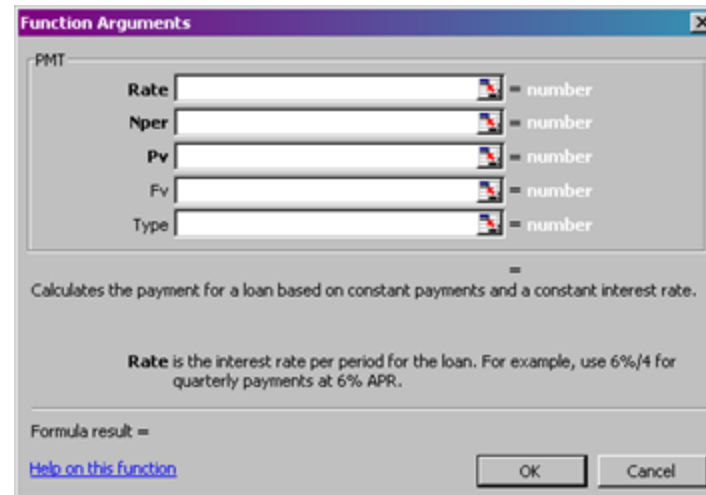
# Variety of Functions

- 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

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- 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, or the total amount that a series of future payments is worth now; also known as the principal
  - **fv** is the future value, or a cash balance you want to attain after the last payment is made. If fv is omitted, it is assumed to be 0 (zero), that is, the future value of a loan is 0
  - **type** is the number 0 (zero) or 1 and indicates when payments are due (0 = end of month = default while 1 = beginning of month)

# PMT Function Continued

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- Remarks
  - The payment returned by PMT includes principal and interest but no taxes, reserve payments, or fees sometimes associated with loans.
  - Make sure that you are consistent about the units you use for specifying rate and nper. If you make monthly payments on a four-year loan at an annual interest rate of 12 percent, use 12%/12 for rate and 4\*12 for nper. If you make annual payments on the same loan, use 12 % for rate and 4 for nper.

# PMT Function Continued

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- 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`

# PMT Function Continued

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- The following formula returns the amount someone must pay to you each month if you loan that person \$5,000 at 12 percent and want to be paid back in five months:
  - `=PMT(12%/12, 5, -5000)` equals \$1,030.20
- You can use PMT to determine payments to annuities other than loans. For example, if you want to save \$50,000 in 18 years by saving a constant amount each month, you can use PMT to determine how much you must save. If you assume you'll be able to earn 6 percent interest on your savings per year, you can use PMT to determine how much to save each month.
  - `=PMT(6%/12, 18*12, 0, 50000)` equals -\$129.08
  - If you pay \$129.08 into a 6 percent savings account every month for 18 years, you will have \$50,000.

# Problem 4.2

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When purchasing large and expensive objects (such as cars, furniture, boats, etc) most of us cannot afford to pay for them right away. Instead, we take out a loan on the object for a certain interest rate and period and pay it back monthly.

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 period 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 **Name** each of the input cells appropriately.

# Problem 4.2 Continued

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	A	B	C
1	<b>Car Loan</b>		
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		

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

# 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

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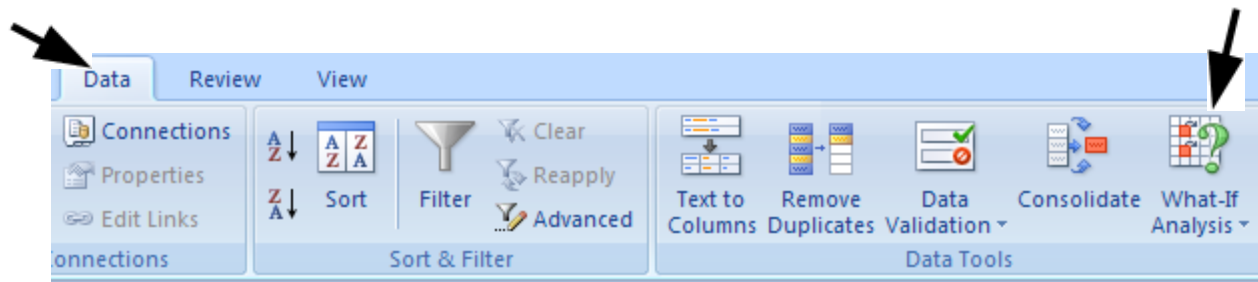
How can you be sure that your payment schedule is correct?

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



# What-If Analysis & Goal Seeking

- Using Excel to scrutinize the impact of changing values in cells that are referenced by a formula in another cell is called what-if analysis.



# Goal Seek Question

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

