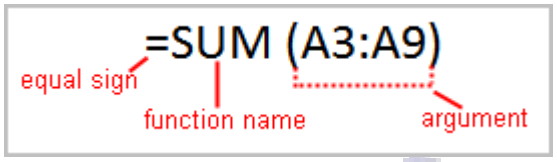
Lec 3 - The Parts of a Function:

Each function has a specific order, called **syntax**, which must be strictly followed for the function to work correctly.

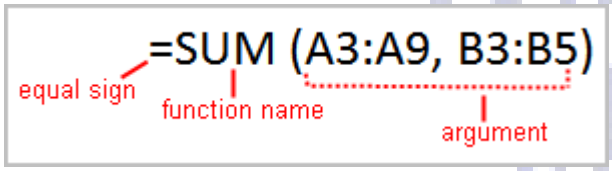
Syntax Order:

1. All functions begin with the = sign.
2. After the = sign define the **function name** (e.g., Sum).
3. Then there will be an **argument**. An argument is the cell range or cell references that are enclosed by parentheses. If there is more than one argument, separate each by a comma.

An example of a function with one argument that adds a range of cells, A3 through A9:



An example of a function with **more than one argument** that calculates the sum of two cell ranges:



Excel literally has hundreds of different **functions** to assist with your calculations. Building formulas can be difficult and time-consuming. Excel's functions can save you a lot of time and headaches.

Excel's Different Functions

There are many different functions in Excel 2007. Some of the more common functions include:

Statistical Functions:

- **SUM** - summation adds a range of cells together.
- **AVERAGE** - average calculates the average of a range of cells.
- **COUNT** - counts the number of chosen data in a range of cells.
- **MAX** - identifies the largest number in a range of cells.
- **MIN** - identifies the smallest number in a range of cells.

Financial Functions:

- **Interest Rates**
- **Loan Payments**
- **Depreciation Amounts**

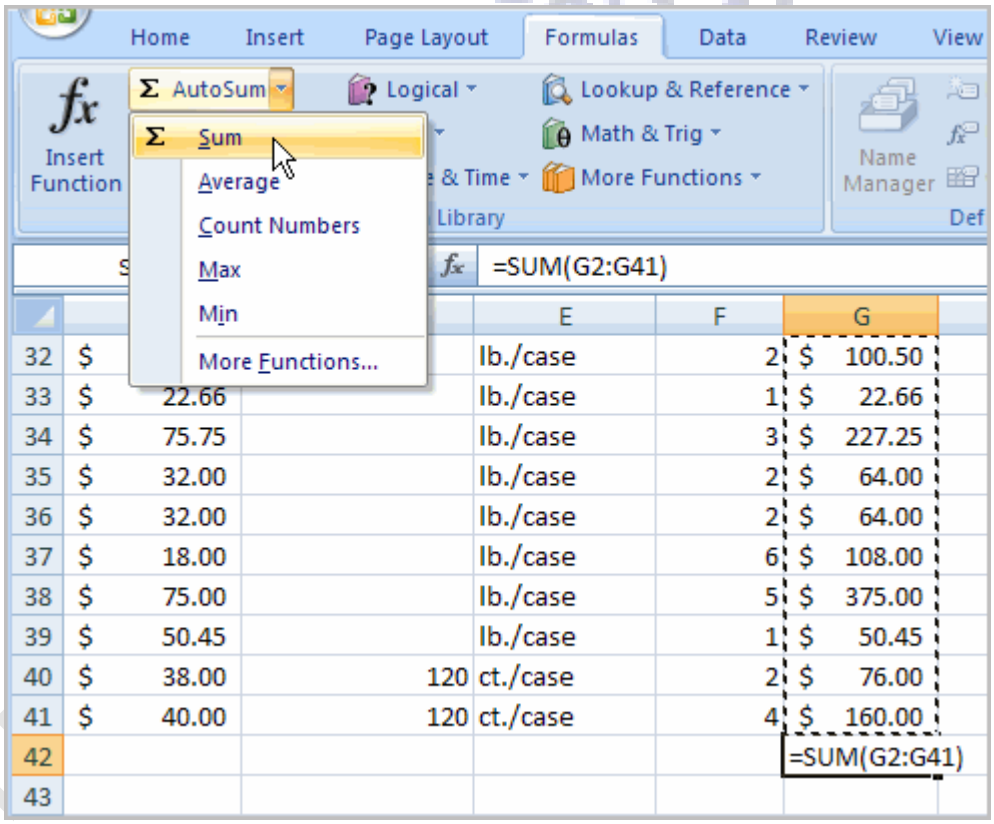
Date and Time functions:

- **DATE** - Converts a serial number to a day of the month
- **Day of Week**
- **DAYS360** - Calculates the number of days between two dates based on a 360-day year
- **TIME** - Returns the serial number of a particular time
- **HOUR** - Converts a serial number to an hour
- **MINUTE** - Converts a serial number to a minute
- **TODAY** - Returns the serial number of today's date
- **MONTH** - Converts a serial number to a month
- **YEAR** - Converts a serial number to a year

You don't have to memorize the functions but should have an idea of what each can do for you.

To Calculate the Sum of a Range of Data Using AutoSum:

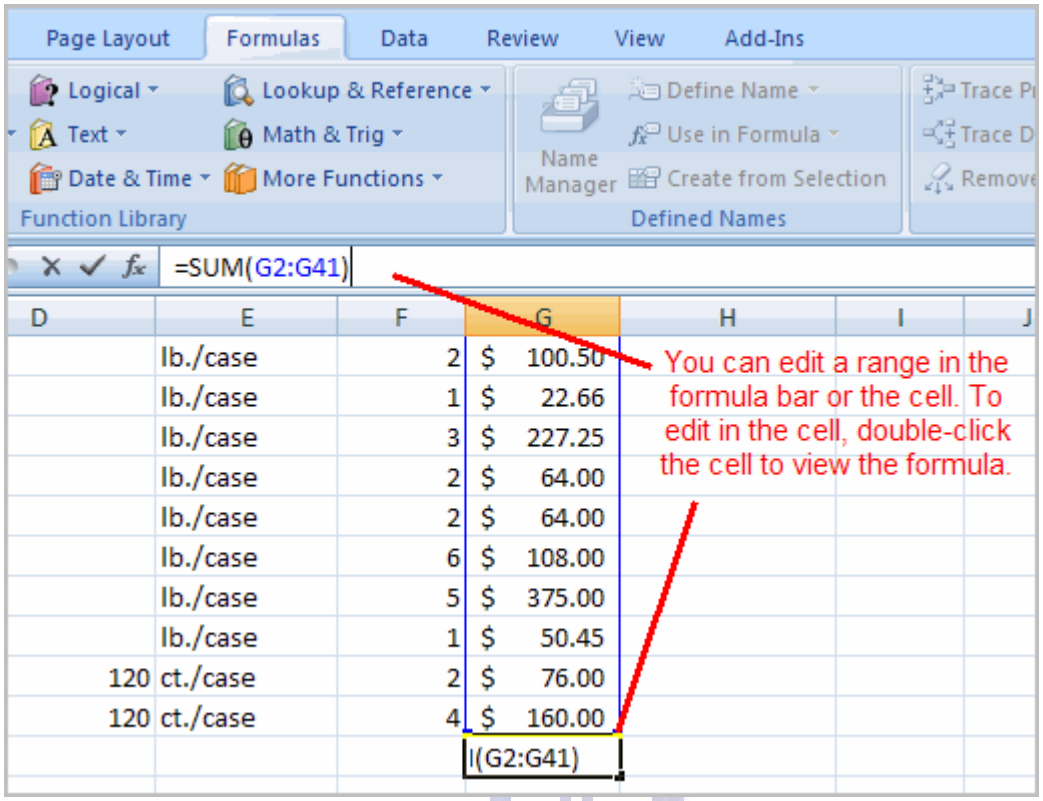
- Select the **Formulas** tab.
- Locate the **Function Library** group. From here, you can access all the available functions.
- Select the cell where you want the function to appear. In this example, select G42.
- Select the drop-down arrow next to the **AutoSum** command.
- Select **Sum**. A formula will appear in the selected cell, G42.
    - This formula, **=SUM(G2:G41)**, is called a **function**. AutoSum command automatically selects the range of cells from G2 to G41, based on where you inserted the function. You can alter the cell range, if necessary.



- Press the **Enter key** or **Enter button** on the formula bar. The total will appear.

To Edit a Function:

- Select the cell where the **function is defined**.
- Insert the cursor in the formula bar.
- **Edit the range** by deleting and changing necessary cell numbers.

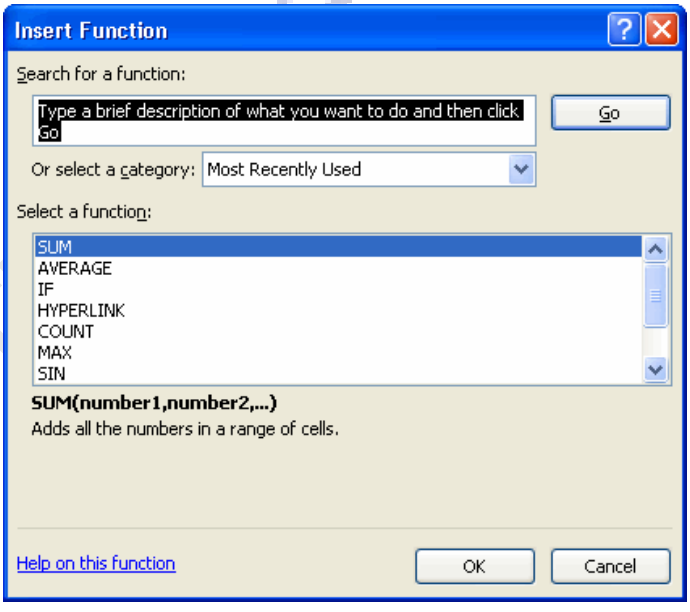


D	E	F	G	H	I	J
	lb./case	2	$ 100.50			
	lb./case	1	$ 22.66			
	lb./case	3	$ 227.25			
	lb./case	2	$ 64.00			
	lb./case	2	$ 64.00			
	lb./case	6	$ 108.00			
	lb./case	5	$ 375.00			
	lb./case	1	$ 50.45			
120	ct./case	2	$ 76.00			
120	ct./case	4	$ 160.00			

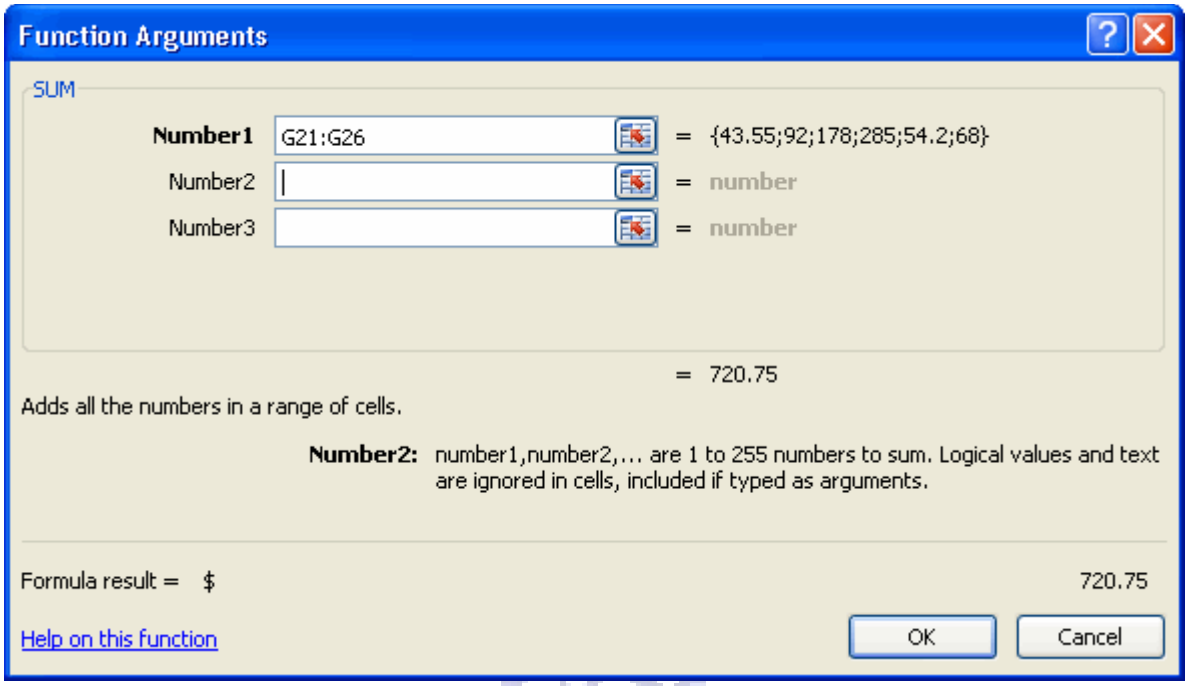
- Click the **Enter** icon.

To Calculate the Sum of Two Arguments:

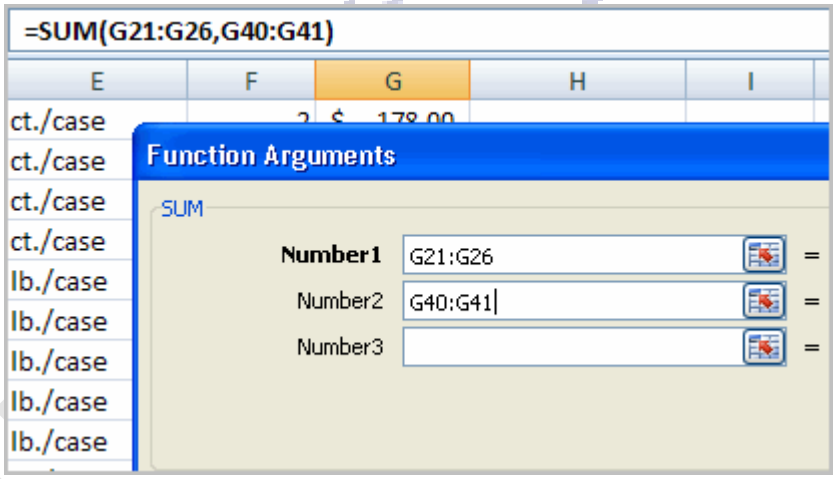
- Select the **cell** where you want the **function to appear**. In this example, G44.
- Click the **Insert Function** command on the Formulas tab. A dialog box appears.
- SUM is selected by default.



- Click **OK** and the **Function Arguments** dialog box appears so that you can enter the range of cells for the function.
- Insert the cursor in the **Number 1** field.
- In the spreadsheet, select the **first range of cells**. In this example, G21 through G26. The argument appears in the Number 1 field.
    - To select the cells, **left-click cell G21** and **drag the cursor** to G26, and then release the mouse button.
- Insert the cursor in the **Number 2** field.



- In the spreadsheet, select the **second range of cells**. In this example, G40 through G41. The argument appears in the Number 2 field.
- Notice that both arguments appear in the function in cell G44 and the formula bar when G44 is selected.



- Click **OK** in the dialog box and the **sum of the two ranges** is calculated.

To Calculate the Average of a Range of Data:

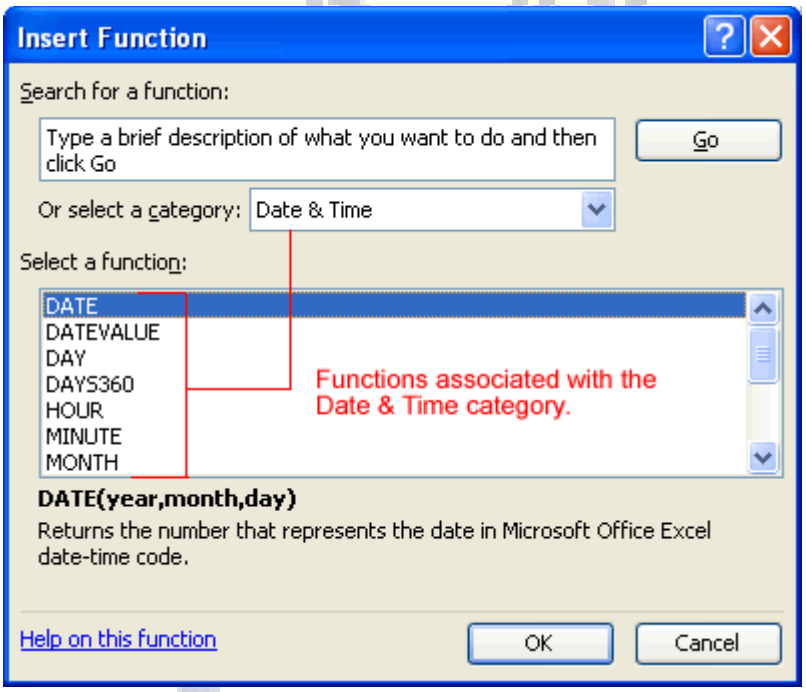
- Select the cell where you want the function to appear.
- Click the drop-down arrow next to the AutoSum command.

- Select Average.
- Click on the **first cell** (in this example, C8) to be included in the formula.
- Left-click and **drag** the mouse to define a cell range (C8 through cell C20, in this example).
- Click the Enter icon to calculate the average.

Accessing Excel 2007 Functions

To Access Other Functions in Excel:

- Using the point-click-drag method, select a cell range to be included in the formula.
- On the Formulas tab, click on the drop-down part of the **AutoSum** button.
- If you don't see the function you want to use (Sum, Average, Count, Max, Min), display additional functions by selecting **More Functions**.
- The **Insert Function** dialog box opens.
- There are three ways to locate a function in the **Insert Function** dialog box:
    - You can type a question in the **Search for a function box** and click **GO**, or
    - You can scroll through the alphabetical list of functions in the **Select a function** field, or
    - You can select a function category in the **Select a category** drop-down list and review the corresponding function names in the **Select a function** field.

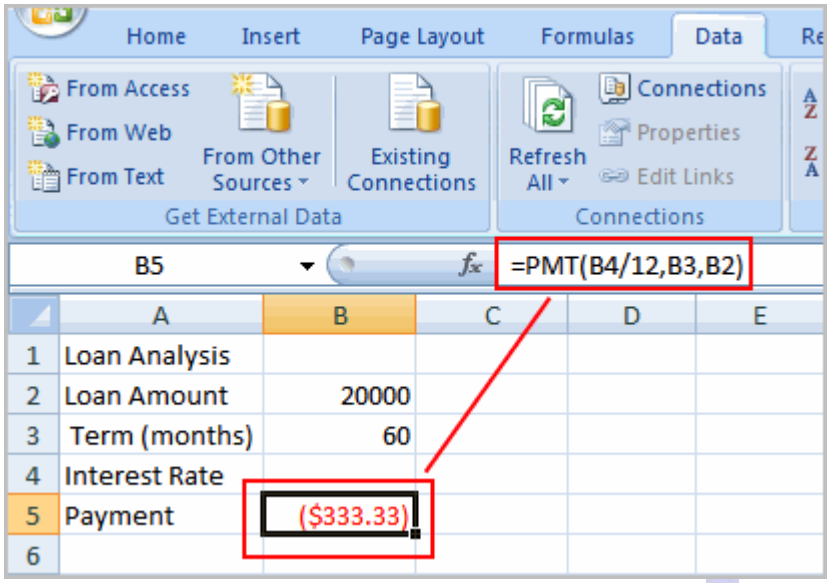


- Select the function you want to use and then click the **OK** button.

What-if Analysis

Example

You need a loan to buy a new car. You know how much **money** you want to borrow, how long of a period you want to take to pay off the loan **(the term)**, and what **payment** you can afford to make each month. But what you need to know is what interest rate you need to qualify for to make the payment $400 a month. In the image below, you can see that if you didn't have interest and just divided this $20,000 into 60 monthly payments, you would pay $333.33 a month. The **What-If Analysis** tool will allow you to easily calculate the interest rate.

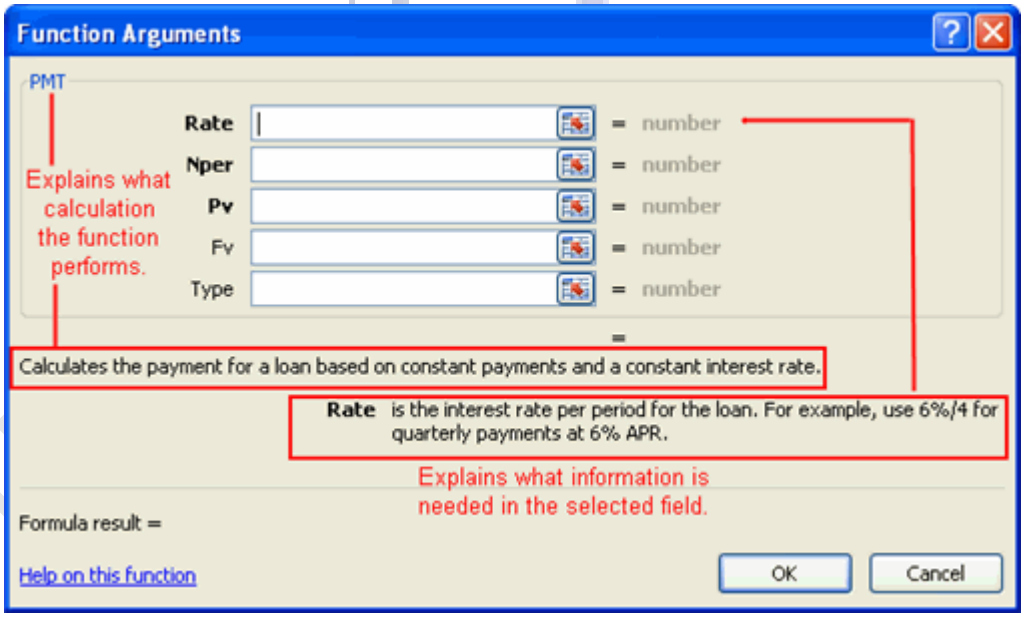


Where Did the Formula Come From?

The **formula** that appears in **cell B5** in the example image is a **function**. It isn't part of the What-if Analysis tool, so you will need to understand functions thoroughly before you use What-if Analysis. For the example scenario described above, you need a formula that will calculate the monthly payment. Instead of writing the formula yourself, you can insert a function to do the calculation for you.

To Insert a Payment Function:

- Select the **Formula** tab.
- Click the **Insert Function** command. A dialog box appears.
- Select **PMT**.
- Click **OK**. A dialog box appears.
- Insert your cursor in the **first field**. A description about the needed information appears at the bottom of the dialog box.



- Select the cell in the spreadsheet with the needed information.
- Insert your cursor in the **next field**. A description about the needed information appears at the bottom of the dialog box.
- Select the cell in the spreadsheet with the needed information.
- Repeat the last two steps until all the necessary information is entered in the dialog box.

- Click **OK**.

What-If Analysis Tools

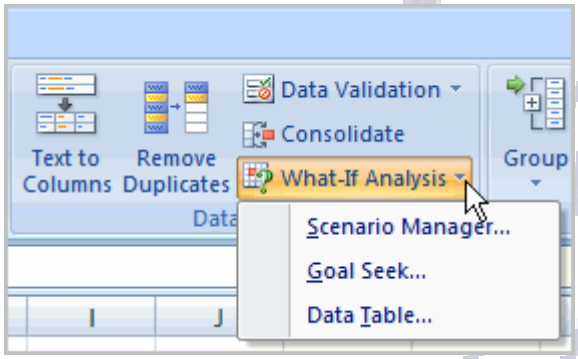
There are **three** What-If analysis tools that you can use. To access these, select the **Data** tab, and locate the **What-If Analysis command**. If you click this command, a menu with three options appears.

Goal seek is useful if you know the needed **result**, but need to find the **input value** that will give you the desired result. In this example, we know the desired result (a $400 monthly payment), and are seeking the input value (the interest rate).

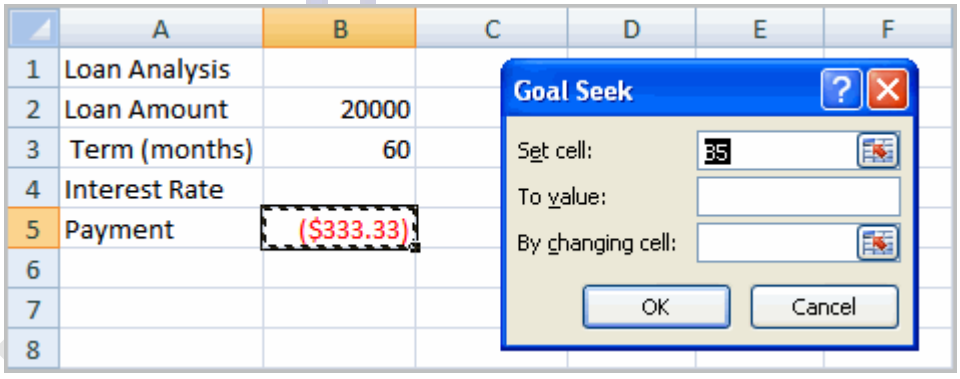
Goal Seek

To Use Goal Seek to Determine an Interest Rate:

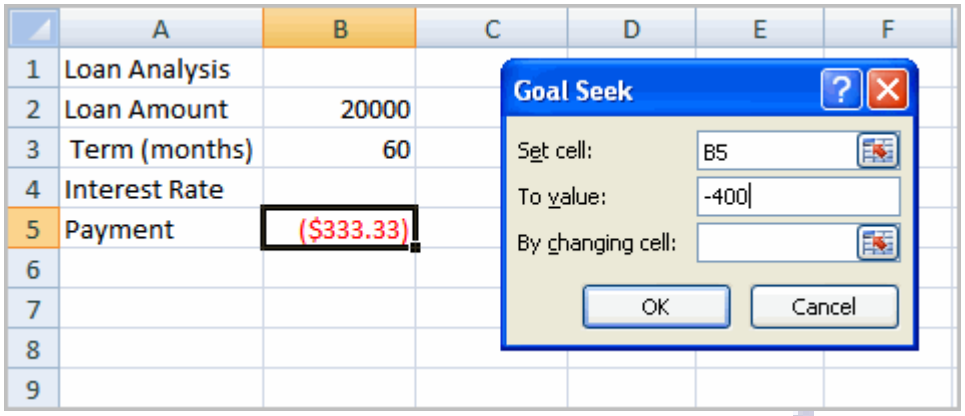
- Select the **Data** tab.
- Locate the **Data Tools** group.
- Click the **What-If Analysis** command. A list of three options appears.



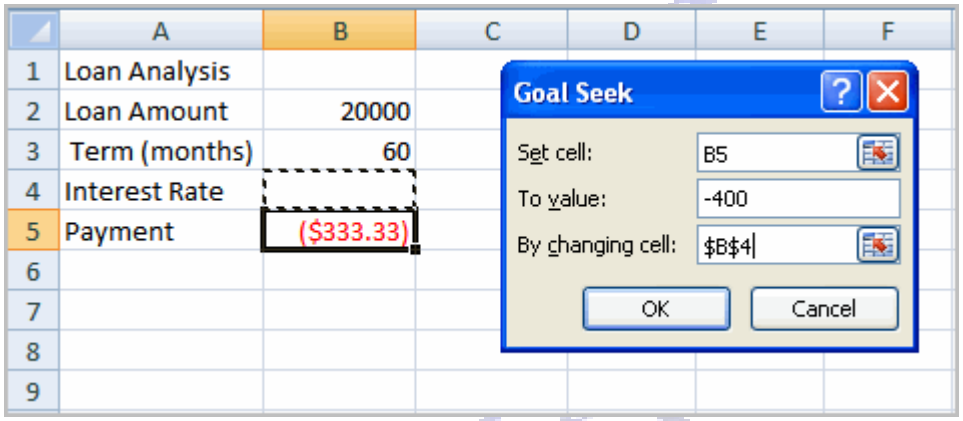
- Select **Goal Seek**. A small dialog box appears.
- Select the **cell** that you what to set to a **specific value**. In this example, we want to set B5, the Payment cell.



- Insert the cursor in the next field.
- Enter a **value** in the **value field**. In this example, type **-$400**. Since we're making a payment that will be subtracted from our loan amount, we have to enter the payment as a negative number.



- Insert the cursor in the next field.
- Select the **cell** that you want to change. This will be the cell that tries various **input values**. In this example, select cell B4, which is the interest rate.



- Click **OK**.
- Then, click **OK** again. The interest rate appears in the cell. This indicates that a 7% interest rate will give us a $400 a month payment on a $20,000 loan that is paid off over 5 years, or 60 months.