Ultimus

Ultimus BPM Suite

Data View Function Reference

Data View Formulas/Functions

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ABS

Description

Returns the absolute value of a number

Syntax

ABS (*number*)

Parameter	Description
number	Any number.

Remarks

An absolute value does not display a positive or negative sign.

Examples

These functions both return 1:

```
ABS(–1)

ABS(1)
```

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ACOS

Description

Returns the arc cosine of a number.

Syntax

ACOS (*number*)

Parameter	Description
number	The cosine of the angle. The cosine can range from 1 to -1.

Remarks

The resulting angle is returned in radians (from 0 to π). To convert the resulting radians to degrees, multiply the radians by 180/PI( ).

Examples

This function returns 1.05:

```
ACOS(.5)
```

This function returns 1.77:

```
ACOS(–.2)
```

See Also

COS

ACOSH

Description

Returns the inverse hyperbolic cosine of a number.

Syntax

ACOSH (*number*)

Parameter	Description
number	Any number equal to or greater than 1.

Examples

This function returns .62:

```
ACOSH(1.2)
```

This function returns 1.76:

```
ACOSH (3)
```

See Also

ASINH

ATANH

COSH

ADDRESS

Description

Creates a cell address as text.

Syntax

ADDRESS (*row*, *column*, *ref_type* [, *a1*] [, *sheet*])

Parameter	Description
row	The row number for the cell address.
column	The column number for the cell address.

ref_type	The cell reference type. Following are the valid values for this argument.

Value	Description
1	Absolute
2	Absolute row, relative column
3	Relative row, absolute column
4	Relative

a1	The reference format. This argument must be TRUE( ) to represent an A1 reference format; Formula One does not support the R1C1 reference format.
sheet	The name of an external worksheet view control. Omitting this argument assumes that the reference exists in the current spreadsheet.

Examples

This function returns $F$5:

```
ADDRESS(5, 6, 1)
```

This function returns SALES!F5:

```
ADDRESS(5, 6, 4, TRUE(), “SALES.”)
```

See Also

- **COLUMN**
- **OFFSET**
- **ROW**

AND

Description

Returns True if all arguments are true; returns False if at least one argument is false.

Syntax

AND (*logical_list*)

Parameter	Description
logical_list	A list of conditions separated by commas. You can include as many as 30 conditions in the list. The list can contain logical values or a reference to a range containing logical values. Text and empty cells are ignored. If there are no logical values in the list, the error #VALUE! is returned.

Examples

This function returns True because both arguments are true:

```
AND(1+1=2, 5+5=10)
```

This function returns False:

```
AND(TRUE(), FALSE())
```

See Also

NOT

OR

ROW

ASC

Description

Converts double-byte to single-byte characters, if possible

In DBCS (Far-East) systems, this function returns a copy of text in which the double-byte characters are converted to single-byte characters, if possible. Characters that cannot be converted are left unchanged.

Syntax

ASC (*text*)

Parameter	Description
text	Text converted from double-byte characters to single-byte characters.

Remarks

On non-DBCS systems, the text returns unchanged.

See Also

DBCS

ASIN

Description

Returns the arcsine of a number.

Syntax

ASIN (*number*)

Parameter	Description
number	The sine of the resulting angle, ranging from -1 to 1.

Remarks

The resulting angle is returned in radians (ranging from -pi/2 to pi/2). To convert the resulting radians to degrees, multiply the radians by 180/pi().

Examples

This function returns –1.57:

```
ASIN(–1)
```

This function returns .41:

```
ASIN(.4)
```

See Also

- **ASINH**
- **PI**
- **SIN**

ASINH

Description

Returns the inverse hyperbolic sine of a number.

Syntax

ASINH (*number*)

Parameter	Description
number	Any number.

Examples

This function returns 2.37:

```
ASINH(5.3)
```

This function returns -2.09:

```
ASINH(-4)
```

See Also

- **ACOSH**
- **ASIN**
- **ATANH**
- **SINH**

ATAN

Description

Returns the arctangent of a number.

Syntax

ATAN (*number*)

Parameter	Description
number	The tangent of the angle.

Remarks

The resulting angle is returned in radians, ranging from -pi/2 to pi/2. To convert the resulting radians to degrees, multiply the radians by 180/pi( ).

Examples

This function returns 1.29:

```
ATAN(3.5)
```

This function returns -1.33:

```
ATAN(–4)
```

See Also

ATAN2

ATANH

PI

TAN

ATAN2

Description

Returns the arctangent of the specified coordinates.

Syntax

ATAN2 (*x*, *y*)

Parameter	Description
x	The x coordinate.
y	The y coordinate.

Remarks

The arctangent is the angle from the x axis to a line with end points at the origin (0, 0) and a point with the given coordinates (x, y). The angle is returned in radians, ranging from -pi to pi, excluding -pi.

Examples

This function returns 1.11:

```
ATAN2(3, 6)
```

This function returns 3.04:

```
ATAN2(–1, .1)
```

See Also

- **ATAN**
- **ATANH**
- **PI**
- **TAN**

ATANH

Description

Returns the inverse hyperbolic tangent of a number.

Syntax

ATANH (*number*)

Parameter	Description
number	A number between -1 and 1, excluding -1 and 1.

Examples

This function returns .55:

```
ATANH(.5)
```

This function returns -.26:

```
ATANH(–.25)
```

See Also

- **ACOS**
- **ASINH**
- **TANH**

AVERAGE

Description

Returns the average of the supplied numbers

The result of **AVERAGE** is also known as the arithmetic mean.

Syntax

AVERAGE (*number_list*)

Parameter	Description

number_list	A list of numbers separated by commas. As many as 30 numbers can be included in the list, and the list can contain numbers or a reference to a range that contains numbers. Text, logical expressions, or empty cells in a referenced range are ignored. All numeric values (including 0) are used.

Examples

This function returns 8.25:

```
AVERAGE(5, 6, 8, 14)
```

This function returns 134, the average of the values in the range C15:C17:

```
AVERAGE(C15:C17)
```

See Also

MAX

MIN

CALL

Description

Calls a procedure in a dynamic link library

. There are two syntax forms of this function. When **CALL** is used with **REGISTER.ID**, as shown in syntax 1, the DLL is loaded and remains loaded until the program is dismissed. When **CALL** is used alone, as shown in syntax 2, the DLL is loaded, the function is called, and then the DLL is unloaded.

Important This function is provided for advanced users only. If you use the **CALL** function incorrectly, you could cause errors that will require you to restart your computer.

Syntax 1

Used with **REGISTER.ID**

CALL(*register_id*, *argument1*, ...)

Syntax 2

Used alone

CALL(*module_text*, *procedure*, *type_text*, *argument1*, ...)

Parameter	Description
register_id	The value returned by a previously executed **REGISTER.ID** function.
argument1	The arguments to be passed to the procedure.
module_text	Quoted text or reference specifying the name of the dynamic link library (DLL) that contains the procedure.
procedure	Text specifying the name of the function in the DLL in Formula One. The function name is case dependent .

type_text Text specifying the data type of the return value and the data types of all arguments to the DLL or code resource. The first letter of *type_text* specifies the return value. The data types you use for *type_text* are described in the following table.

Data Type	Description	Pass by	C Declaration
A	Logical (False = 0, True = 1)	Value	short int
B	IEEE 8-byte floating point number	Value	double
C	Null-terminated string (255 characters maximum)	Reference	char *
D	Byte-counted string (first byte contains string length; 255 characters maximum)	Reference	unsigned char *
E	IEEE 8-byte floating point number	Reference	double *
F	Null-terminated string (255 characters maximum)	Reference	char *
G	Byte-counted string (first byte contains string length; 255 characters maximum)	Reference	unsigned char *
H	Unsigned 2-byte integer	Value	unsigned short int
I	Signed 2-byte integer	Value	short int
J	Signed 4-byte integer	Value	long int
L	Logical (False = 0, True = 1)	Reference	short int *
M	Signed 2-byte integer	Reference	short int *
N	Signed 4-byte integer	Reference	long int *

Remarks

For declarations made in C, it is assumed that your compiler defaults to 8-byte doubles, 2-byte short integers, and 4-byte long integers. In the Windows programming environment, all pointers should be far pointers.

Pascal calling conventions are used for all functions called from DLLs. For most C compilers, you must add the –**Pascal** keyword to the function declaration.

If the return value for your custom function uses a pass-by-reference data type, a null pointer can be passed as the return value. The null pointer is interpreted as the #NUM! error value.

For the F and G data types, a custom function can modify an allocated string buffer. If the return value type code is F or G, the value returned by the function is ignored. The list of function arguments is searched for the first data type that corresponds to the return value type. The current contents of the allocated string buffer is taken for the return value. 256 bytes is allocated for the argument; therefore, a function can return a larger string than it receives.

You can use a single digit (*n*), with a value from 1 to 9, as the code for *data_type*. The variable in the location pointed to by the *n*th argument is modified instead of the return value; this process is referred to as modifying in place. The *n*th argument must be a pass-by-reference data type. In addition, you must declare the function void. For most C compilers, you can add the **Void** keyword to the function declaration.

Examples

Syntax 1

In Formula One, the following macro formula registers the GetTickCount function from Microsoft Windows. GetTickCount returns the number of milliseconds that have elapsed since Microsoft Windows was started.

```
REGISTER.ID("Kernel32","GetTickCount","J")
```

Assuming that this **REGISTER.ID** function is in cell A5, after your macro registers GetTickCount, you can use the **CALL** function to return the number of milliseconds that have elapsed since Windows was started:

```
CALL(A5)
```

Syntax 2

On a worksheet, you can use the following **CALL** formula (syntax 2) to call the GetTickCount function:

```
CALL("Kernel32","GetTickCount","J!")
```

CEILING

Description

Rounds a number up to the nearest multiple of a specified significance

Syntax

CEILING (*number, significance*)

Parameter	Description
number	The value to round.
significance	The multiple to which to round.

Remarks

Regardless of the sign of the number, the value is rounded up, away from zero. If number is an exact multiple of significance, no rounding occurs.

If the number or significance is non-numeric, the error #VALUE! is returned. When the arguments have opposite signs, the error #NUM! is returned.

Examples

This function returns 1.25:

```
CEILING(1.23459, .05)
```

This function returns –150:

```
CEILING(–148.24, –2)
```

See Also

- EVEN
- FLOOR
- INT
- ODD
- ROUND
- TRUNC

CHAR

Description

Returns a character that corresponds to the supplied ASCII code

Syntax

CHAR (*number*)

Parameter	Description
number	A value between 1 and 255 that specifies an ASCII character.

Remarks

The character and associated numeric code are defined by Windows in the ASCII character set.

Examples

This function returns F:

```
CHAR(70)
```

This function returns #:

```
CHAR(35)
```

See Also

- CODE

CHOOSE

Description

Returns a value from a list of numbers based on the index number supplied.

Syntax

CHOOSE (*index*, *item_list*)

Parameter	Description
index	A number that refers to an item in *item_list*.
item_list	A list of numbers, formulas, or text separated by commas. This argument can also be a range reference. You can specify as many as 29 items in the list.

Remarks

index can be a cell reference; *index* can also be a formula that returns any value from 1 to 29. If *index* is less than 1 or greater than the number of items in *item_list*, #VALUE! is returned. If *index* is a fractional number, it is truncated to an integer.

Examples

This function returns Q2:

```
CHOOSE(2,"Q1", "Q2", "Q3", "Q4")
```

This function returns the average of the contents of range A1:A10:

```
AVERAGE(CHOOSE(1, A1:A10, B1:B10, C1:C10))
```

See Also

INDEX

CLEAN

Description

Removes all nonprintable characters from the supplied text.

Syntax

CLEAN (*text*)

Parameter	Description
text	Any worksheet information.

Remarks

Text that is imported from another environment may require this function.

Examples

This function returns Payments Due because the character returned by CHAR (8) is nonprintable:

```
CLEAN("Payments " & CHAR(8) & "Due")
```

See Also

CHAR

TRIM

CODE

Description

Returns a numeric code representing the first character of the supplied string.

Syntax

CODE (*text*)

Parameter	Description
text	Any string.

Remarks

The numeric code and associated string are defined in your computer’s character set.

Examples

This function returns 65:

```
CODE("A")
```

This function returns 98:

```
CODE("b")
```

See Also

CHAR

COLUMN

Description

Returns the column number of the supplied reference.

Syntax

COLUMN (*reference*)

Parameter	Description
reference	A reference to a cell or range. Omitting the argument returns the number of the column in which COLUMN is placed.

Examples

This function returns 2:

```
COLUMN(B3)
```

This function returns 4 if the function is entered in cell D2:

```
COLUMN()
```

See Also

COLUMNS

ROW

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COLUMNS

Description

Returns the number of columns in a range reference.

Syntax

COLUMNS (*range*)

Parameter	Description
range	A reference to a range of cells.

Example

This function returns 4:

```
COLUMNS(A1:D5)
```

See Also

COLUMN

ROWS

CONCATENATE

Description

Joins several text strings into one string.

Syntax

CONCATENATE (*text1*, *text2*, ...)

Parameter	Description
text1, text2, ...	Up to 30 text items to be joined into a single text item. The text items can be strings, numbers, or single-cell references.

Remarks

The "&" operator can be used instead of CONCATENATE to join text items.

Examples

The following example returns "Sale Price" it is the same as typing "Sale"&" "&"Price":

```
CONCATENATE ("Sale ", "Price")
```

Suppose in an inventory worksheet, C2 contains "extruder1", C5 contains " gaskets", and C8 contains the number 15. The following example returns "Inventory currently holds 15 gaskets for extruder1":

```
CONCATENATE ("Inventory currently holds ", C8, " ", C5," for ", C2)
```

See Also

- **COLUMN**
- **ROWS**

COS

Description

Returns the cosine of an angle.

Syntax

COS (*number*)

Parameter	Description
number	The angle in radians. If the angle is in degrees, convert the angle to radians by multiplying the angle by PI()/180.

Examples

This function returns .126:

```
COS(1.444)
```

This function returns .28:

```
COS(5)
```

See Also

- **ACOS**
- **ASINH**
- **ATANH**
- **COSH**
- **PI**

COSH

Description

Returns the hyperbolic cosine of a number.

Syntax

COSH (*number*)

Parameter	Description
number	Any number.

Examples

This function returns 4.14:

```
COSH(2.10)
```

This function returns 1.03:

```
COSH(.24)
```

See Also

- ASINH
- ATANH
- COS

COUNT

Description

Returns the number of values in the supplied list.

Syntax

COUNT (*value_list*)

Parameter	Description
value_list	A list of values. The list can contain as many as 30 values.

Remarks

COUNT only numerates numbers or numerical values such as logical values, dates, or text representations of dates. If you supply a range, only numbers and numerical values in the range are counted. Empty cells, logical values, text, and error values in the range are ignored.

Examples

This function returns 2:

```
COUNT(5, 6, "Q2")
```

This function returns 3:

```
COUNT("03/06/94", "06/21/94", "10/19/94")
```

See Also

- AVERAGE

- COUNTA
- SUM

COUNTIF

Description

Returns the number of cells within a range which meet the given criteria.

Syntax

COUNTIF (*range*, *criteria*)

Parameter	Description
range	Range of cells you want to count.
criteria	Number, expression, or text that defines which cells are counted.

See Also

- AVERAGE
- COUNTA
- SUM
- SUMIF

COUNTA

Description

Returns the number of nonblank values in the supplied list.

Syntax

COUNTA (expression_list)

Parameter	Description
expression_list	A list of expressions. As many as 30 expressions can be included in the list.

Remarks

COUNTA returns the number of cells that contain data in a range. Null values (" ") are counted, but references to empty cells are ignored.

Examples

This function returns 4:

```
COUNTA(32, 45, "Earnings", "")
```

This function returns 0 when the specified range contains empty cells:

```
COUNTA(C38:C40)
```

See Also

- AVERAGE
- COUNT
- PRODUCT
- SUM

DATE

Description

Returns the serial number of the supplied date.

Syntax

DATE (*year*, *month*, *day*)

Parameter	Description
year	A number from 1900 to 2078. If year is between 1920 to 2019, you can specify two digits to represent the year; otherwise specify all four digits.
month	A number representing the month (for example, 12 represents December). If a number greater than 12 is supplied, the number is added to the first month of the specified year.
day	A number representing the day of the month. If the number you specify for day exceeds the number of days in that month, the number is added to the first day of the specified month.

Examples

This function returns 34506:

```
DATE(94, 6, 21)
```

This function returns 36225:

```
DATE(99, 3, 6)
```

See Also

- DATEVALUE
- DAY
- MONTH
- NOW
- TIMEVALUE
- TODAY
- YEAR

DATEVALUE

Description

Returns the serial number of a date supplied as a text string.

Syntax

DATEVALUE (*text*)

Parameter	Description
text	A date in text format between January 1, 1900, and December 31, 2078. If you omit the year, the current year is used.

Examples

This function returns 34399:

```
DATEVALUE("3/6/94")
```

This function returns 35058:

```
DATEVALUE("12/25/95")
```

See Also

NOW

TIMEVALUE

TODAY

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DAY

Description

Returns the day of the month

Value returned corresponds to the date represented by the supplied number.

Syntax

DAY (*serial_number*)

Parameter	Description
serial_number	A date represented as a serial number or as text (for example, 06-21-94 or 21-Jun-94).

Examples

This function returns 6:

```
DAY(34399)
```

This function returns 21:

```
DAY("06-21-94")
```

See Also

- **HOUR**
- **MINUTE**
- **MONTH**
- **NOW**
- **SECOND**
- **TODAY**
- **WEEKDAY**
- **YEAR**

DAYS360

Description

Returns the number of days between two dates

Value returned is based on a 360-day year (twelve 30-day months). Use this function to help compute payments if your accounting system is based on twelve 30-day months.

Syntax

DAYS360 (*start_date*, *end_date*, [*method*])

Parameter	Description
start_date, *end_date*	The two dates between which you want to know the number of days.
method	A logical value that specifies whether the European or US method should be used in the calculation. If False (or omitted), the US (NASD) method is used. If True, the European method is used. The default is based on the local translation. It should be correct for your location.

Remarks

start_date and *end_date* can be text strings using numbers to represent the month, day, and year (for example, "1/30/93" or "1-30-93"), or they can be serial numbers representing the dates.

If *start_date* occurs after *end_date*, **DAYS360** returns a negative number.

If *method* is set to False and *start_date* is the 31st of a month, it becomes equal to the 30th of the same month. If *end_date* is the 31st of a month and *start_date* is less than the 30th of a month, the ending date becomes equal to the 1st of the next month, otherwise the ending date becomes equal to the 30th of the same month.

If *method* is set to True, start_dates or *end_dates* which occur on the 31st of a month become equal to the 30th of the same month.

Note To determine the number of days between two dates in a normal year, you can use normal subtraction--for example, "12/31/93"-"1/1/93" equals 364.

Example

```
DAYS360("1/30/93", "2/1/93") equals 1
```

DB

Description

Returns the real depreciation of an asset

Value returned is for a specific period of time using the fixed-declining balance method.

Syntax

DB (*cost, salvage, life, period* [, *months*])

Parameter	Description
cost	The initial cost of the asset.
salvage	The salvage value of the asset.
life	The number of periods in the useful life of the asset.
period	The period for which to calculate the depreciation. The time units used to determine period and life must match.
months	The number of months in the first year of the item's life. Omitting this argument assumes there are 12 months in the first year.

Example

This function returns 1451.52:

```
DB(10000, 1000, 7, 3)
```

See Also

DDB

SLN

SYD

VDB

DBCS

Description

Converts text from single-byte to double-byte characters

Returns a copy of *text* in which the single-byte characters (if any) have been converted to double-byte characters. Any single-byte characters that do not have double-byte equivalents are left in their original (single-byte) form.

Syntax

DBCS

Parameter	Description
text	The text containing single-byte characters which is converted to

double-byte characters.

See Also

ASC

DDB

Description

Returns the depreciation of an asset for a specific period of time

Value returned uses the double-declining balance method or a declining balance factor you supply.

Syntax

DDB (*cost, salvage, life, period* [, *factor*])

Parameter	Description
cost	The initial cost of the asset.
salvage	The salvage value of the asset.
life	The number of periods in the useful life of the asset.
period	The period for which to calculate the depreciation. The time units used to determine period and life must match.
factor	The rate at which the balance declines. Omitting this argument assumes a default factor of 2, the double-declining balance factor.

Remarks

The double-declining balance method uses an accelerated rate where the highest depreciation occurs in the first period, decreasing in successive periods.

All arguments for this function must be positive numbers.

Example

This function returns 1457.73:

```
DDB(10000,1000, 7, 3)
```

See Also

DB

SLN

SYD

VDB

DOLLAR

Description

Returns the specified number as text

Uses currency format and the supplied precision.

Syntax

DOLLAR (*number* [, *precision*])

Parameter	Description
number	A number, a formula that evaluates to a number, or a reference to a cell that contains a number.
precision	A value representing the number of decimal places to the right of the decimal point. Omitting this argument assumes the standard number of decimal places for the local currency.

Note

"Local" currency refers to the currency format for the current system, i.e., the one specified in Regional Settings in Control Panel

Remarks

Dollar will return the specified number format as text using currency format for the current system. If you wish to always convert to the US Dollar format, regardless of the language of your system, then use the USDOLLAR worksheet function.

Examples

US Example

When using a US setting in Windows, this function returns $1023.79:

```
DOLLAR(1023.789)
```

This function returns $500:

```
DOLLAR(495.301, –2)
```

UK Example

When using a British setting in Windows, this function returns £1023.8:

```
DOLLAR(1023.789)
```

This function returns £500:

```
DOLLAR(1023.789)
```

German Example

When using a German setting in Windows, this function returns 1023,8 DM:

```
DOLLAR(1023.789)
```

This function returns 500 DM :

```
DOLLAR(495.301, –2)
```

See Also

FIXED
TEXT
VALUE

ERROR.TYPE

Description

Returns a number corresponding to an error.

Syntax

ERROR.TYPE (*error_ref*)

Parameter	Description
error_ref	A cell reference.

Remarks

The following error text or numbers can be returned by this function.

Number	Description
1	#NULL!
2	#DIV/0!
3	#VALUE!
4	#REF!
5	#NAME?
6	#NUM!
7	#N/A
#N/A	Other

Example

This function returns 2 if the formula in cell A1 attempts to divide by zero:

```
ERROR.TYPE(A1)
```

See Also

ISERR
ISERROR

EVEN

Description

Rounds the specified number up to the nearest even integer.

Syntax

EVEN (*number*)

Parameter	Description
number	Any number, a formula that evaluates to a number, or a reference to a cell that contains a number.

Examples

This function returns 4:

```
EVEN(2.5)
```

This function returns 2032:

```
EVEN(2030.45)
```

See Also

CEILING

FLOOR

INT

ODD

ROUND

TRUNC

EXACT

Description

Compares two expressions for identical, case-sensitive matches

True is returned if the expressions are identical; False is returned if they are not.

Syntax

EXACT (*expression1, expression2*)

Parameter	Description
expression1	Any text.
expression2	Any text.

Examples

This function returns True:

```
EXACT("Match", "Match")
```

This function returns False:

```
EXACT("Match", "match")
```

See Also

LEN

SEARCH

created with Help to RTF file format converter

EXP

Description

Returns e raised to the specified power

The constant e is 2.71828182845904 (the base of the natural logarithm).

Syntax

EXP (*number*)

Parameter	Description
number	Any number as the exponent.

Examples

This function returns 12.18:

```
EXP(2.5)
```

This function returns 20.09:

```
EXP(3)
```

See Also

LN

LOG

FACT

Description

Returns the factorial of a specified number.

Syntax

FACT (*number*)

Parameter	Description
number	Any non-negative integer. If you supply a real number, **FACT** truncates the number to an integer before calculation.

Examples

This function returns 2:

```
FACT(2.5)
```

This function returns 720:

```
FACT(6)
```

See Also

PRODUCT

FALSE

Description

Returns the logical value False

This function always requires the trailing parentheses.

Syntax

FALSE ( )

See Also

TRUE

FIND

Description

Searches for a string of text within another text string and returns the character position at which the search string first occurs.

Syntax

FIND (*search_text, text* [, *start_position*])

Parameter	Description
search_text	The text to find. If you specify an empty string (" "), **FIND** matches the first character in text.
text	The text to be searched.
start_position	The character position in text where the search begins. The first character in text is character number 1. When you omit this argument, the default starting position is character number 1.

Remarks

FIND is case-sensitive. You cannot use wildcard characters in the *search_text*.

Examples

This function returns 12:

```
FIND("time", "There’s no time like the present")
```

This function returns 19:

```
FIND("4", "Aisle 4, Part 123-4-11", 9)
```

See Also

- **EXACT**
- **LEN**
- **MID**
- **SEARCH**

FINDB

Description

Searches for a string of text within another text string and returns the byte position at which the search string first occurs.

Syntax

FINDB (*search_text, text* [, *start_position*])

Parameter	Description
search_text	The text to find. If you specify an empty string (" "), **FINDB** matches the first byte in text.
text	The text to be searched.
start_position	The byte position in text where the search begins. The first byte in text is byte number 1. When you omit this argument, the default starting position is byte number 1.

Remarks

FINDB is case-sensitive. You cannot use wildcard characters in the *search_text*.

start_position and return values are expressed in bytes, so these values might differ on DBCS systems. On non-DBCS systems, FIND and FINDB functions are identical, but FINDB should only be used in special applications that require distinctions between single-byte and double-byte characters.

Examples

This function returns 12:

```
FINDB("time", "There’s no time like the present")
```

This function returns 19:

```
FINDB("4", "Aisle 4, Part 123-4-11", 9)
```

FIXED

Description

Rounds, formats and returns a number

Rounds a number to the supplied precision, formats the number in decimal format, and returns the result as text.

Syntax

FIXED (*number* [, *precision*][, *no_commas*])

Parameter	Description
number	Any number.
precision	The number of digits that appear to the right of the decimal place. When this argument is omitted, a default *precision* of 2 is used. If you specify negative *precision*, number is rounded to the left of the decimal point. You can specify a *precision* as great as 127 digits.
no_commas	Determines if thousands separators (commas) are used in the result. Use 1 to exclude commas in the result. If *no_commas* is 0 or the argument is omitted, thousands separators are included (for example, 1,000.00).

Examples

This function returns 2,000.500:

```
FIXED(2000.5, 3)
```

This function returns 2010:

```
FIXED(2009.5, –1, 1)
```

See Also

DOLLAR

ROUND

TEXT

VALUE

FLOOR

Description

Rounds a number down to the nearest multiple of a specified significance.

Syntax

FLOOR (*number, significance*)

Parameter	Description

number	The value to round.
significance	The multiple to which to round.

Remarks

Regardless of the sign of the *number*, the value is rounded down, toward zero. If *number* is an exact multiple of *significance*, no rounding occurs.

If *number* or *significance* is non-numeric, #NAME? is returned. When the arguments have opposite signs, #NUM! is returned.

Examples

This function returns 1.2:

```
FLOOR(1.23459, .05)
```

This function returns –148:

```
FLOOR(–148.24, –2)
```

See Also

CEILING

EVEN

INT

ODD

ROUND

TRUNC

FV

Description

Returns the future value of an annuity

Value returned is based on regular payments and a fixed interest rate.

Syntax

FV (*interest*, *nper*, *payment* [, *pv*] [, *type*])

Parameter	Description
interest	The fixed interest rate.
nper	The number of payments in an annuity.
payment	The fixed payment made each period.
pv	The present value, or the lump sum amount, the annuity is currently worth. When you omit this argument, a present value of 0 is assumed.
type	Indicates when payments are due. Use 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. When you omit this argument, 0 is assumed.

Remarks

The units used for *interest* must match those used for *nper*. For example, if the annuity has an 8 percent annual interest rate over a period of 5 years, specify 8 percent/12 for *interest* and 5*12 for *nper*.

Cash paid out, such as a payment, is shown as a negative number. Cash received, such as a dividend check, is shown as a positive number.

Examples

This function returns 4,774.55:

```
FV(5%, 8, –500)
```

This function returns 531,550.86:

```
FV(10%/12, 240, –700, 1)
```

See Also

IPMT

NPER

PMT

PPMT

PV

RATE

HLOOKUP

Description

Searches the top row of a table for a value and returns the contents of a cell in that table that corresponds to the location of the search value.

Syntax

HLOOKUP (*search_item*, *search_range*, *row_index*)

Parameter	Description
search_item	A value, text string, or reference to a cell containing a value that is matched against data in the top row of *search_range*.
search_range	A reference to the range (table) to be searched. The cells in the first row of *search_range* can contain numbers, text, or logical values. The contents of the first row must be in ascending order (for example, –2, –1, 0, 2…, A through Z, False, True). Text searches are not case-sensitive.
row_index	The row in *search_range* from which the matching value is returned. *row_index* can be a number from 1 to the number of rows in *search_range*. If *row_index* is less than 1, the error #VALUE! is returned. When *row_index* is greater than the number of rows in the table, the error #REF! is returned.

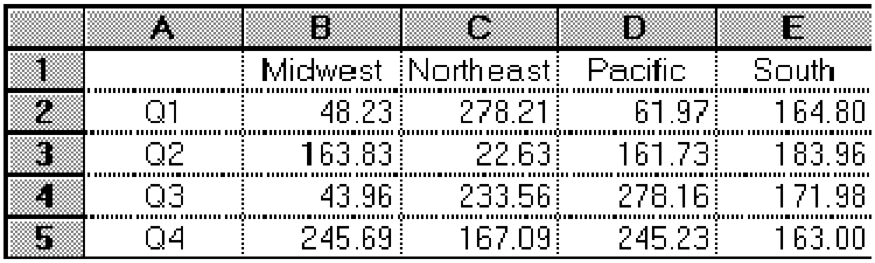
Remarks

HLOOKUP compares the information in the top row of *search_range* to the supplied *search_item*. When a match is found, information located in the same column and supplied row (*row_index*) is returned.

If *search_item* cannot be found in the top row of *search_range*, the largest value that is less than *search_item* is used. When *search_item* is less than the smallest value in the first row of the *search_range*, the error #REF! is returned.

Examples

The following examples use this worksheet.



	A	B	C	D	E
1		Midwest	Northeast	Pacific	South
2	Q1	48.23	278.21	61.97	164.80
3	Q2	163.83	22.63	161.73	183.96
4	Q3	43.96	233.56	278.16	171.98
5	Q4	245.69	167.09	245.23	163.00

This function returns 22.63:

```
HLOOKUP("Northeast", B1:E5, 3)
```

This function returns #REF!:

```
HLOOKUP("Pacific", B1:E5, 7)
```

See Also

- **INDEX**
- **LOOKUP**
- **MATCH**
- **VLOOKUP**

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HOUR

Description

Returns the hour component of the specified time in 24-hour format.

Syntax

HOUR (*serial_number*)

Parameter	Description
serial_number	The time as a serial number. The decimal portion of the number represents time as a fraction of the day.

Remarks

The result is an integer ranging from 0 (12:00 AM) to 23 (11:00 PM).

Examples

This function returns 9:

```
HOUR(34259.4)
```

This function returns 23:

```
HOUR(34619.976)
```

See Also

- **DAY**
- **MINUTE**
- **MONTH**
- **NOW**
- **SECOND**
- **WEEKDAY**
- **YEAR**

IF

Description

Tests the condition and returns the specified value.

Syntax

IF (*condition*, *true_value*, *false_value*)

Parameter	Description
condition	Any logical expression.
true_value	The value to be returned if condition evaluates to True.
false_value	The value to be returned if condition evaluates to False.

Example

This function returns Greater if the contents of A1 is greater than 10 and Less if the contents of A1 is less than 10:

```
IF(A1>10, "Greater", "Less")
```

See Also

- **AND**
- **FALSE**
- **NOT**
- **OR**
- **TRUE**

INDEX

Description

Returns the contents of a cell from a specified range.

Syntax

INDEX (*reference* [, *row*] [, *column*] [, *range_number*])

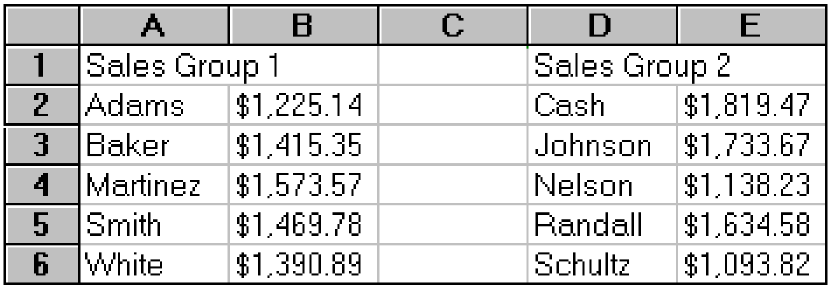
Parameter	Description
reference	A reference to one or more ranges. If *reference* specifies more than one range, separate each *reference* with a comma and enclose *reference* in parentheses. For example, (A1:C6, B7:E14, F4). If each range in *reference* contains only one row or column, you can omit the row or column argument. For example, if reference is A1:A15, you can omit the column argument INDEX(A1:A15, 3,, 1).
row	The row number in *reference* from which to return data.
column	Column number in *reference* from which to return data.
range_number	Specifies the range from which data is returned if *reference* contains more than one range. For example, if *reference* is (A1:A10, B1:B5, D14:E23), A1:A10 is *range_number* 1, B1:B5 is *range_number* 2, and D14:E23 is *range_number* 3.

Remarks

If *row*, *column*, and *range_number* do not point to a cell within *reference*, #REF! is returned. If *row* and *column* are omitted, **INDEX** returns the range in *reference* specified by *range_number*.

Examples

The following examples use this worksheet.



	A	B	C	D	E
1	Sales Group 1			Sales Group 2	
2	Adams	$1,225.14		Cash	$1,819.47
3	Baker	$1,415.35		Johnson	$1,733.67
4	Martinez	$1,573.57		Nelson	$1,138.23
5	Smith	$1,469.78		Randall	$1,634.58
6	White	$1,390.89		Schultz	$1,093.82

This function returns $1415.35:

```
INDEX(A2:B6, 2, 2)
```

This function returns $1634.58:

```
INDEX((A2:B6, D2:E6), 4, 2, 2)
```

See Also

CHOOSE

HLOOKUP

LOOKUP
MATCH
VLOOKUP

INDIRECT

Description

Returns the contents of the cell referenced by the specified cell.

Syntax

INDIRECT (*ref_text* [, *a1*])

Parameter	Description
ref_text	A reference to a cell that references a third cell. If *ref_text* is not a valid reference, the error #REF! is returned.
a1	The reference format. This argument must be TRUE() to represent an A1 reference format; Formula One does not support the R1C1 reference format.

Example

This function returns the contents of the cell that C1 references. If C1 contains "D1," then the contents of D1is returned:

```
INDIRECT(C1)
```

See Also

OFFSET

INT

Description

Rounds the supplied number down to the nearest integer.

Syntax

INT (*number*)

Parameter	Description
number	Any real number.

Examples

This function returns 10:

```
INT(10.99)
```

This function returns -11:

```
INT(–10.99)
```

See Also

- **CEILING**
- **FLOOR**
- **MOD**
- **ROUND**
- **TRUNC**

IPMT

Description

Returns the interest payment of an annuity for a given period

Value returned is based on regular payments and a fixed periodic interest rate.

Syntax

IPMT (*interest*, *per*, *nper*, *pv*, [*fv*], [*type*])

Parameter	Description
interest	The fixed periodic interest rate.
per	The period for which to return the interest payment. This number must be between 1 and *nper*.
nper	The number of payments.
pv	The present value, or the lump sum amount the annuity is currently worth.
fv	The future value, or the value after all payments are made. If this argument is omitted, the future value is assumed to be 0.
type	Indicates when payments are due. Use 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. When you omit this argument, 0 is assumed.

Remarks

The units used for interest must match those used for *nper*. For example, if the annuity has an 8 percent annual interest rate over a period of 5 years, specify 8 percent/12 for *interest* and 5*12 for *nper*.

Cash paid out, such as a payment, is shown as a negative number. Cash received, such as a dividend check, is shown as a positive number.

Examples

This function returns -117.87:

```
IPMT(8%/12, 2, 48, 18000)
```

This function returns -117.09:

```
IPMT(8%/12, 2, 48, 18000, 0, 1)
```

See Also

- FV
- PMT
- PPMT
- RATE

IRR

Description

Returns internal rate of return for a series of periodic cash flows.

Syntax

IRR (*cash_flow* [, *guess*])

Parameter	Description
cash_flow	A reference to a range that contains values for which to calculate the internal rate of return. The values must contain at least one positive and one negative value. During calculation, **IRR** uses the order in which the values appear to determine the order of the cash flow. Text, logical values, and empty cells in the range are ignored.
guess	The estimate of the internal rate of return. If no argument is supplied, a rate of return of 10 percent is assumed.

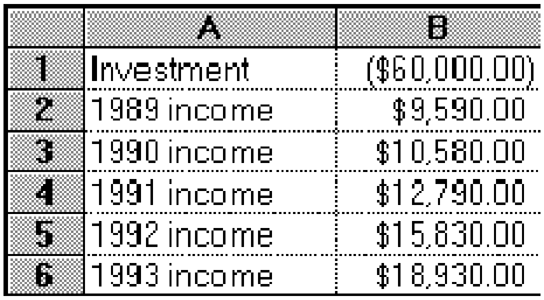
Remarks

The internal rate of return is the interest rate received for an investment consisting of payments (specified by negative numbers) and investments (specified by positive numbers).

IRR is calculated iteratively, cycling through the calculation until the result is accurate to .00001 percent. If the result cannot be found after 20 iterations, #NUM! is returned. When this occurs, supply a different value for *guess*.

Examples

The following examples use this worksheet.



	A	B
1	Investment	($60,000.00)
2	1989 income	$9,590.00
3	1990 income	$10,580.00
4	1991 income	$12,790.00
5	1992 income	$15,830.00
6	1993 income	$18,930.00

This function returns 3.72 percent:

```
IRR(B1:B6)
```

This function returns -49.26 percent:

```
IRR(B1:B3, –20%)
```

See Also

- **MIRR**
- **NPV**
- **RATE**

ISBLANK

Description

Determines if the specified cell is blank.

Syntax

ISBLANK (*reference*)

Parameter	Description
reference	A reference to any cell.

Remarks

If the referenced cell is blank, True is returned. False is returned if the cell is not blank.

Example

This function returns True if A1 is a blank cell:

```
ISBLANK(A1)
```

See Also

- **ISERR**
- **ISERROR**
- **ISLOGICAL**
- **ISNA**
- **ISNONTEXT**
- **ISNUMBER**
- **ISREF**
- **ISTEXT**

ISERR

Description

Determines if the specified expression returns an error value.

Syntax

ISERR (*expression*)

Parameter	Description
expression	Any expression.

Remarks

If the expression returns any error except #N/A!, True is returned. Otherwise, False is returned.

Example

This function returns True if A1 contains a formula that returns an error such as #NUM!:

```
ISERR(A1)
```

See Also

- ISBLANK
- ISERROR
- ISLOGICAL
- ISNA
- ISNONTEXT
- ISNUMBER
- ISREF
- ISTEXT

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ISERROR

Description

Determines if the specified expression returns an error value.

Syntax

ISERROR (*expression*)

Parameter	Description
expression	Any expression.

Remarks

If the *expression* returns any error value, such as #N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!, True is returned. Otherwise, False is returned.

Examples

This function returns True:

```
ISERROR(4/0)
```

This function returns False if A1 contains a formula that does not return an error.

```
ISERROR(A1)
```

See Also

- ISBLANK
- ISERR
- ISLOGICAL
- ISNA
- ISNONTEXT
- ISNUMBER
- ISREF
- ISTEXT

ISLOGICAL

Description

Determines if the specified expression returns a logical value.

Syntax

ISLOGICAL (*expression*)

Parameter	Description
expression	Any expression.

Remarks

If the *expression* returns a logical value, True is returned. Otherwise, False is returned.

Example

This function returns True because **ISBLANK** returns a logical value:

```
ISLOGICAL(ISBLANK(A1))
```

See Also

- ISBLANK
- ISERR
- ISERROR
- ISNA
- ISNONTEXT
- ISNUMBER
- ISREF
- ISTEXT

ISNA

Description

Determines if the specified expression returns the value not available error.

Syntax

ISNA (*expression*)

Parameter	Description
expression	Any expression.

Remarks

If the *expression* returns the #N/A! error, True is returned. Otherwise, False is returned.

Example

This function returns True if cell A1 contains the **NA ( )** function or returns the error value #N/A!:

```
ISNA(A1)
```

See Also

ISBLANK
ISERR
ISERROR
ISLOGICAL
ISNONTEXT
ISNUMBER
ISREF
ISTEXT

ISNONTEXT

Description

Determines if the specified expression is not text.

Syntax

ISNONTEXT (*expression*)

Parameter	Description
expression	Any expression.

Remarks

If the *expression* returns any value that is not text, True is returned. Otherwise, False is returned.

Examples

This function returns True if cell F3 contains a number or is a blank cell:

```
ISNONTEXT(F3)
```

This function returns False:

```
ISNONTEXT("text")
```

See Also

- ISBLANK
- ISERR
- ISERROR
- ISLOGICAL
- ISNA
- ISNUMBER
- ISREF
- ISTEXT

ISNUMBER

Description

Determines if the specified expression is a number.

Syntax

ISNUMBER (*expression*)

Parameter	Description
expression	Any expression.

Remarks

If the *expression* returns a number, True is returned. Otherwise, False is returned. If *expression* returns a number represented as text (for example, “12”), False is returned.

Examples

This function returns True:

```
ISNUMBER(123.45)
```

This function returns False:

```
ISNUMBER("123")
```

See Also

- ISBLANK
- ISERR
- ISERROR
- ISLOGICAL
- ISNA
- ISNONTEXT
- ISREF
- ISTEXT

ISREF

Description

Determines if the specified expression is a range reference.

Syntax

ISREF (*expression*)

Parameter	Description
expression	Any expression.

Remarks

If the expression returns a range reference, True is returned. Otherwise, False is returned.

Example

This function returns True:

```
ISREF(A3)
```

See Also

ISBLANK
ISERR
ISERROR
ISLOGICAL
ISNA
ISNONTEXT
ISNUMBER
ISTEXT

ISTEXT

Description

Determines if the specified expression is text.

Syntax

ISTEXT (*expression*)

Parameter	Description
expression	Any expression.

Remarks

If the *expression* returns text, True is returned. Otherwise, False is returned.

Example

This function returns True:

```
ISTEXT("2nd Quarter")
```

See Also

- **ISBLANK**
- **ISERR**
- **ISERROR**
- **ISLOGICAL**
- **ISNA**
- **ISNONTEXT**
- **ISNUMBER**
- **ISREF**

LEFT

Description

Returns the leftmost characters from the specified text string.

Syntax

LEFT (*text* [, *num_chars*])

Parameter	Description
text	Any text string.
num_chars	The number of characters to return. This value must be greater than or equal to zero. If *num_chars* is greater than the number of characters in text, the entire string is returned. Omitting this argument assumes a value of 1.

Examples

This function returns 2:

```
LEFT("2nd Quarter")
```

This function returns 2nd:

```
LEFT("2nd Quarter", 3)
```

See Also

- **MID**
- **RIGHT**

LEFTB

Description

Returns the leftmost bytes from the specified text string.

Syntax

LEFTB (*text* [, *num*_bytes])

Parameter	Description
text	Any text string.
Num_bytes	The number of bytes to return. This value must be greater than or equal to zero. If *num_chars* is greater than the number of bytes in text, the entire string is returned. Omitting this argument assumes a value of 1.

Remarks

num_bytes is expressed in bytes, so this value might differ on DBCS systems. On non-DBCS systems, LEFT and LEFTB functions are identical, but LEFTB should only be used in special applications that require distinctions between single-byte and double-byte characters.

Examples

This function returns 2:

```
LEFTB("2nd Quarter")
```

This function returns 2nd:

```
LEFTB("2nd Quarter", 3)
```

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LEN

Description

Returns the number of characters in the supplied text string.

Syntax

LEN (*text*)

Parameter	Description
text	Any text string. Spaces in the string are counted as characters.

Examples

This function returns 11:

```
LEN("3rd Quarter")
```

This function returns 3:

```
LEN("1-3")
```

See Also

EXACT
SEARCH

LENB

Description

Returns the number of bytes in the supplied text string.

Syntax

LENB (*text*)

Parameter	Description
text	Any text string. Spaces in the string are counted as bytes.

Remarks

The value of *text* might differ on DBCS systems. On non-DBCS systems, LEN and LENB functions are identical, but LENB should only be used in special applications that require distinctions between single-byte and double-byte characters.

Examples

This function returns 11:

```
LENB("3rd Quarter")
```

This function returns 3:

```
LENB("1-3")
```

LN

Description

Returns the natural logarithm (based on the constant e) of a number.

Syntax

LN (*number*)

Parameter	Description
number	Any positive real number.

Remarks

LN is the inverse of the **EXP** function.

Examples

This function returns 2.50:

```
LN(12.18)
```

This function returns 3.00:

```
LN(20.09)
```

See Also

- **EXP**
- **LOG**
- **LOG10**

LOG

Description

Returns the logarithm of a number to the specified base.

Syntax

LOG (*number* [, *base*])

Parameter	Description
number	Any positive real number.
base	The base of the logarithm. Omitting this argument assumes a base of 10.

Examples

This function returns 0:

```
LOG(1)
```

This function returns 1:

```
LOG(10)
```

See Also

- **EXP**
- **LN**
- **LOG10**

LOG10

Description

Returns the base-10 logarithm of a number.

Syntax

LOG10 (*number*)

Parameter	Description
number	Any positive real number.

Examples

This function returns 2.41:

```
LOG10(260)
```

This function returns 2:

```
LOG10(100)
```

See Also

EXP

LN

LOG

LOOKUP

Description

Searches for a value in one range and returns the contents of the corresponding position in a second range.

Syntax

LOOKUP (*lookup_value*, *lookup_range*, *result_range*)

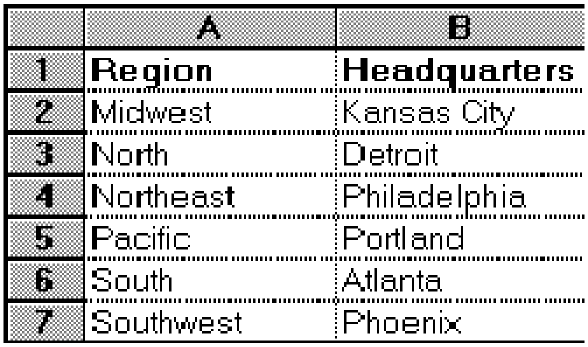
Parameter	Description
lookup_value	The value for which to search in the first range.
lookup_range	The first range to search and contains only one row or one column. The range can contain numbers, text, or logical values. To search *lookup_range* correctly, the expressions in the range must be placed in ascending order (for example, –2, –1, 0, 1, 2..., A through Z, False, True). The search is not case-sensitive.
result_range	A range of one row or one column that is the same size as *lookup_range*.

Remarks

If *lookup_value* does not have an exact match in *lookup_range*, the largest value that is less than or equal to *lookup_value* is found and the corresponding position in *result_range* is returned. When *lookup_value* is smaller than the data in *lookup_range*, #N/A is returned.

Examples

The following examples use this worksheet.



	A	B
1	**Region**	**Headquarters**
2	Midwest	Kansas City
3	North	Detroit
4	Northeast	Philadelphia
5	Pacific	Portland
6	South	Atlanta
7	Southwest	Phoenix

This function returns Detroit:

```
    LOOKUP("North", A2:A7, B2:B7)
```

This function returns #N/A:

```
    LOOKUP("Alabama", A2:A7, B2:B7)
```

See Also

- **HLOOKUP**
- **INDEX**
- **VLOOKUP**

LOWER

Description

Changes the characters in the specified string to lowercase characters. Numeric characters in the string are not changed.

Syntax

LOWER (*text*)

Parameter	Description
text	Any string.

Examples

This function returns 3rd quarter:

```
    LOWER("3rd Quarter")
```

This function returns john doe:

```
    LOWER("JOHN DOE")
```

See Also

- **PROPER**

UPPER

MATCH

Description

A specified value is compared against values in a range.
The position of the matching value in the search range is returned.

Syntax

MATCH (*lookup_value*, *lookup_range*, *comparison*)

Parameter	Description
lookup_value	The value against which to compare. It can be a number, text, or logical value or a reference to a cell that contains one of those values.
lookup_range	The range to search; it contains only one row or one column. The range can contain numbers, text, or logical values.
comparison	A number that represents the type of comparison to be made between *lookup_value* and the values in *lookup_range*. When you omit this argument, comparison method 1 is assumed. When comparison is 0, the first value that is equal to *lookup_value* is matched. When using this comparison method, the values in *lookup_range* can be in any order. When *comparison* is 1, the largest value that is less than or equal to *lookup_value* is matched. When using this comparison method, the values in *lookup_range* must be in ascending order (for example, ...-2, -1, 0, 1, 2..., A through Z, False, True). When *comparison* is -1, the smallest value that is greater than or equal to *lookup_value* is matched. When using this comparison method, the values in *lookup_range* must be in descending order (for example, True, False, Z through A, ...2, 1, 0, -1, -2...).

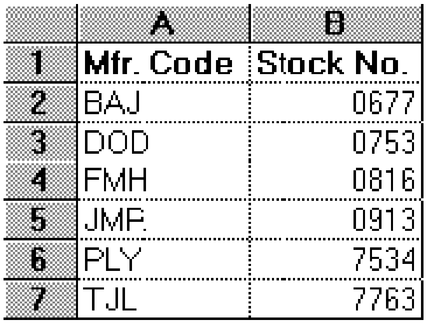
Remarks

When using comparison method 0 and *lookup_value* is text, *lookup_value* can contain wildcard characters. The wildcard characters are * (asterisk), which matches any sequence of characters, and ? (question mark), which matches any single character.

When no match is found for *lookup_value*, #N/A is returned.

Examples

The following examples use this worksheet.



	A	B
1	Mfr. Code	Stock No.
2	BAJ	0677
3	DOD	0753
4	FMH	0816
5	JMP.	0913
6	PLY	7534
7	TJL	7763

This function returns 5:

```
MATCH(7600, B2:B7,1)
```

This function returns 2:

```
MATCH("D*", A2:A7,0)
```

See Also

- **HLOOKUP**
- **INDEX**
- **LOOKUP**
- **VLOOKUP**

MAX

Description

Returns the largest value in the specified list of numbers.

Syntax

MAX (*number_list*)

Parameter	Description
number_list	A list of as many as 30 numbers, separated by commas.
	The list can contain numbers, logical values, text representations of numbers, or a reference to a range containing those values.
	Error values or text that cannot be translated into numbers return errors.
.	If a range reference is included in the list, text, logical expressions, and empty cells in the range are ignored
	If there are no numbers in the list, 0 is returned.

Examples

This function returns 500:

```
   MAX(50, 100, 150, 500, 200)
```

This function returns the largest value in the range:

```
   MAX(A1:F12)
```

See Also

AVERAGE

MIN

created with Help to RTF file format converter

MID

Description

Returns the specified number of characters from a text string

Begins with the specified starting position.

Syntax

MID (*text*, *start_position*, *num_chars*)

Parameter	Description
text	The string from which to return characters.
start_position	The position of the first character to return from text. If *start_position* is 1, the first character in text is returned. If *start_position* is greater than the number of characters in text, an empty string (" ") is returned. If *start_position* is less than 1, #VALUE! is returned.
num_chars	The number of characters to return. If *num_chars* is negative, #VALUE! is returned.

Remarks

If *start_position* plus the number of characters in *num_chars* exceeds the length of text, the characters from *start_position* to the end of text are returned.

Examples

This function returns Expenses:

```
   MID("Travel Expenses", 8, 8)
```

This function returns 45:

```
   MID("Part #45-7234", 7, 2)
```

See Also

CODE

FIND
LEFT
RIGHT
SEARCH

MIDB

Description

Returns the specified number of bytes from a text string
Begins with the specified starting position.

Syntax

MIDB (*text*, *start_position*, *num_bytes*)

Parameter	Description
text	The string from which to return bytes.
start_position	The position of the first byte to return from text. If *start_position* is 1, the first byte in text is returned. If *start_position* is greater than the number of bytes in text, an empty string (" ") is returned. If *start_position* is less than 1, #VALUE! is returned.
num_bytes	The number of bytes to return. If *num_bytes* is negative, #VALUE! Is returned.

Remarks

If *start_position* plus the number of bytes in *num*_bytes exceeds the length of text, the bytes from *start_position* to the end of text are returned.

start_position and **num_bytes** are expressed in bytes, so these values might differ on DBCS systems. On non-DBCS systems, MID and MIDB functions are identical, but MIDB should only be used in special applications that require distinctions between single-byte and double-byte characters.

Examples

This function returns Expenses:

```
MIDB("Travel Expenses", 8, 8)
```

This function returns 45:

```
MIDB("Part #45-7234", 7, 2)
```

MIN

Description

Returns the smallest value in the specified list of numbers.

Syntax

MIN (*number_list*)

Parameter	Description
number_list	A list of as many as 30 numbers, separated by commas. The list can contain numbers, logical values, text representations of numbers, or a reference to a range containing those values. Error values or text that cannot be translated into numbers return errors. If a range reference is included in the list, text, logical expressions, and empty cells in the range are ignored. If there are no numbers in the list, 0 is returned

Examples

This function returns 50:

```
MIN(50, 100, 150, 500, 200)
```

This function returns the smallest value in the range:

```
MIN(A1:F12)
```

See Also

AVERAGE

MAX

MINUTE

Description

Returns the minute that corresponds to the supplied date.

Syntax

MINUTE (*serial_number*)

Parameter	Description
serial_number	The time as a serial number. The decimal portion of the number represents time as a fraction of the day.

Remarks

The result is an integer ranging from 0 to 59.

Examples

This function returns 36:

```
MINUTE(34506.4)
```

This function returns 48:

```
MINUTE(34399.825)
```

See Also

- DAY
- HOUR
- MONTH
- NOW
- SECOND
- WEEKDAY
- YEAR

MIRR

Description

Returns the modified internal rate of return for a series of periodic cash flows.

Syntax

MIRR (*cash_flows*, *finance_rate*, *reinvest_rate*)

Parameter	Description
cash_flow	A reference to a range that contains values for which to calculate the modified internal rate of return. The values must contain at least one positive and one negative value. Values that represent cash received should be positive; negative values represent cash paid. During calculation, **MIRR** uses the order in which the values appear to determine the order of cash flow. Text, logical values, and empty cells in the range are ignored.
finance_rate	The interest rate paid on money used in the cash flow.
reinvest_rate	The interest rate received on money reinvested from the cash flow.

Remarks

The modified internal rate of return considers the cost of the investment and the interest received on the reinvestment of cash.

Examples

The following examples use this worksheet.

This function returns 5.20 percent:

```
MIRR(B1:B6, 12%, 8%)
```

This function returns –40.93 percent:

```
MIRR(B1:B3, 12%, 8%)
```

See Also

IRR
NPV
RATE

MOD

Description

Returns the remainder after dividing a number by a specified divisor.

Syntax

MOD (number, divisor)

Parameter	Description
number	Any number.
divisor	Any nonzero number. If *divisor* is 0, #DIV/0! is returned.

Examples

This function returns 1:

```
MOD(–23, 3)
```

This function returns -2:

```
MOD(–23, –3)
```

See Also

INT
ROUND
TRUNC

MONTH

Description

Returns the month that corresponds to the supplied date.

Syntax

MONTH (*serial_number*)

Parameter	Description

serial_number	The date as a serial number or as text (for example, 06-21-94 or 21-Jun-94).

Remarks

MONTH returns a number ranging from 1 (January) to 12 (December).

Examples

This function returns 6:

```
MONTH("06-21-94")
```

This function returns 10:

```
MONTH(34626)
```

See Also

- **DAY**
- **HOUR**
- **MINUTE**
- **NOW**
- **SECOND**
- **TODAY**
- **WEEKDAY**
- **YEAR**

N

Description

Tests the supplied value and returns the value if it is a number.

Syntax

N (*value*)

Parameter	Description
value	A value or a reference to a cell containing a value to test.

Remarks

Numbers are returned as numbers, serial numbers formatted as dates are returned as serial numbers, and the logical function TRUE() is returned as 1. All other expressions return 0.

Examples

This function returns 32467:

```
N(32467)
```

This function returns 1 if A4 contains the logical function TRUE:

```
N(A4)
```

See Also

T
VALUE

NA

Description

Returns the error value #N/A, which represents “not available.”

Syntax

NA ( )

Remarks

Use **NA** to mark cells that lack data without leaving them empty. Empty cells may not be correctly represented in some calculations.

Although **NA** does not use arguments, you must supply the empty parentheses to correctly reference the function.

See Also

ISNA

created with Help to RTF file format converter

NOT

Description

Returns a logical value that is the opposite of its value.

Syntax

NOT (*logical*)

Parameter	Description
logical	An expression that returns a logical value such as True or False.

Remarks

If logical is false, **NOT** returns True. Conversely, if logical is true, **NOT** returns False.

Examples

This function returns False:

```
NOT(TRUE())
```

This function returns False:

```
NOT(MONTH("12/25/94") = 12)
```

See Also

- **AND**
- **IF**
- **OR**

NOW

Description

Returns the current date and time as a serial number.

Syntax

NOW ( )

Remarks

In a serial number, numbers to the left of the decimal point represent the date; numbers to the right of the decimal point represent the time. The result of this function changes only when a recalculation of the worksheet occurs.

See Also

- **DATE**
- **DAY**
- **HOUR**
- **MINUTE**
- **MONTH**
- **SECOND**
- **TODAY**
- **WEEKDAY**
- **YEAR**

NPER

Description

Returns the number of periods of an investment

Number is based on regular periodic payments and a fixed interest rate.

Syntax

NPER (*interest*, *pmt*, *pf* [, *fv*] [, *type*])

Parameter	Description
interest	The fixed interest rate.
pmt	The fixed payment made each period. Generally, *pmt* includes the principle and interest, not taxes or other fees.
pf	The present value, the lump-sum amount that a series of future payments is currently worth.

fv	The future value, the balance to attain after the final payment. Omitting this argument assumes a future balance of 0.
type	Indicates when payments are due. Use 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. When you omit this argument, 0 is assumed.

Examples

This function returns 36.67:

```
NPER(12%/12, –350, –300, 16000, 1)
```

This function returns 36.98:

```
NPER(1%, –350, –300, 16000)
```

See Also

FV

IPMT

PMT

PPMT

PV

RATE

NPV

Description

Returns the net present value of an investment

Value is based on a series of periodic payments and a discount rate.

Syntax

NPV (*discount_rate*, *value_list*)

Parameter	Description
discount_rate	The rate of discount for one period.
value_list	A list of as many as 29 arguments or a reference to a range that contains values that represent payments and income. During calculation, **NPV** uses the order in which the values appear to determine the order of cash flow. Numbers, empty cells, and text representations of numbers are included in the calculation. Errors and text that cannot be translated into numbers are ignored. If *value_list* is a range reference, only numeric data in the range is included in the calculation. Other types of data in the range, such as empty cells, logical values, text, and error values are ignored.

Remarks

The time span **NPV** uses for calculation begins one period before the first cash flow date and ends when the last cash flow payment is made. This function is based on future cash flows. When your first cash flow occurs at the beginning of the first period, the first value must be added to the **NPV** result, not supplied as a value in *value_list*.

Example

This function returns 811.57:

```
NPV(8%, –12000, 3000, 3000, 3000, 7000)
```

See Also

FV

IRR

PV

ODD

Description

Rounds the specified number up to the nearest odd integer.

Syntax

ODD (*number*)

Parameter	Description
number	Any number, a formula that evaluates to a number, or a reference to a cell that contains a number.

Examples

This function returns 5:

```
ODD(3.5)
```

This function returns 7:

```
ODD(6)
```

See Also

CEILING

EVEN

FLOOR

INT

ROUND

TRUNC

OFFSET

Description

Returns the contents of a range that is offset from a starting point in the spreadsheet.

Syntax

OFFSET (*reference*, *rows*, *columns* [, *height*] [, *width*])

Parameter	Description
reference	A reference to a cell from which the offset reference is based. If you specify a range reference, #VALUE! is returned.
rows	The number of rows from reference that represents the upper-left cell of the offset range. A positive number represents rows below the starting cell; a negative number represents rows above the starting cell. If *rows* places the upper-left cell of the offset range outside the spreadsheet boundary, #REF! is returned.
columns	The number of columns from reference that represents the upper-left cell of the offset range. A positive number represents columns right of the starting cell; a negative number represents columns left of the starting cell. If *columns* places the upper-left cell of the offset range outside the spreadsheet boundary, #REF! is returned.
height	A positive number representing the number of rows to include in the offset range. Omitting this argument assumes a single row.
width	A positive number representing the number of columns to include in the offset range. Omitting this argument assumes a single column.

Remarks

OFFSET does not change the current selection in the worksheet. Because it returns a reference, **OFFSET** can be used in any function that requires or uses a cell or range reference as an argument.

Examples

This function returns the contents of cell D4:

```
OFFSET(B1, 3, 2, 1, 1)
```

This function returns the sum of the values in the range E3:F5:

```
SUM(OFFSET(A1, 2, 4, 3, 2))
```

OR

Description

Returns True if at least one of a series of logical arguments is true.

Syntax

OR (*logical_list*)

Parameter	Description
logical_list	A list of conditions separated by commas. You can include as many as 30 conditions in the list. The list can contain logical values or a reference to a range containing logical values. Text and empty cells are ignored. If there are no logical values in the list, the error value #VALUE! is returned.

Example

This function returns True because one of the arguments is true:

```
OR(1 + 1 = 1, 5 + 5 = 10)
```

See Also

AND

IF

NOT

PI

Description

Returns the value of pi (p)

Value is approximately 3.14159265358979 when calculated to 15 significant digits.

Syntax

PI ( )

Remarks

Although **PI** does not use arguments, you must supply the empty parentheses to correctly reference the function.

See Also

COS

SIN

TAN

PMT

Description

Returns the periodic payment of an annuity

Return is based on regular payments and a fixed periodic interest rate.

Syntax

PMT (*interest*, *nper*, *pv* [, *fv*] [, *type*])

Parameter	Description
interest	The fixed periodic interest rate.
nper	The number of periods in the annuity.
pv	The present value, or the amount the annuity is currently worth.
fv	The future value, or the amount the annuity will be worth. When you omit this argument, a future value of 0 is assumed.
type	Indicates when payments are due. Use 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. When you omit this argument, 0 is assumed.

Remarks

PMT returns only the principal and interest payment, it does not include taxes or other fees.

The units used for *interest* must match those used for *nper*. For example, if the annuity has an 8 percent annual interest rate over a period of 5 years, specify 8 percent/12 for *interest* and 5*12 for *nper*.

Cash paid out, such as a payment, is shown as a negative number. Cash received, such as a dividend check, is shown as a positive number.

Examples

This function returns -439.43:

```
PMT(8%/12, 48, 18000)
```

This function returns -436.52:

```
PMT(8%/12, 48, 18000, 0, 1)
```

See Also

IPMT

FV

NPER

PPMT

PV

RATE

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PPMT

Description

Returns the principle paid on an annuity for a given period.

Syntax

PPMT (*interest*, *per*, *nper*, *pv*, [*fv*], [*type*])

Parameter	Description
interest	The fixed periodic interest rate.
per	The period for which to return the principle.
nper	The number of periods in the annuity.
pv	The present value, or the amount the annuity is currently worth.
fv	The future value, or the amount the annuity will be worth. When you omit this argument, a future value of 0 is assumed.
type	Indicates when payments are due. Use 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. When you omit this argument, 0 is assumed.

Remarks

The units used for *interest* must match those used for *nper*. For example, if the annuity has an 8 percent annual interest rate over a period of 5 years, specify 8 percent/12 for *interest* and 5*12 for *nper*.

Examples

This function returns -321.56:

```
PPMT(8%/12, 2, 48, 18000)
```

This function returns -319.43:

```
PPMT(8%/12, 2, 48, 18000, 0, 1)
```

See Also

FV
IPMT
NPER
PMT
PV
RATE

PRODUCT

Description

Multiplies a list of numbers and returns the result.

Syntax

PRODUCT (*number_list*)

Parameter	Description
number_list	A list of as many as 30 numbers, separated by commas. The list can contain numbers, logical values, text representations of numbers, or a reference to a

range containing those values.

Error values or text that cannot be translated into numbers return errors.

If a range reference is included in the list, text, logical expressions, and empty cells in the range are ignored.

All numeric values, including 0, are used in the calculation.

Example

This function returns 24:

```
PRODUCT(1, 2, 3, 4)
```

See Also

FACT

SUM

PROPER

Description

Returns the specified string in proper-case format.

Syntax

PROPER (*text*)

Parameter	Description
text	Any string.

Remarks

In proper-case format, the first alphabetic character in a word is capitalized. If an alphabetic character follows a number, punctuation mark, or space, it is capitalized. All other alphabetic characters are lowercase. Numbers are not changed by **PROPER**.

Examples

This function returns 3Rd Quarter:

```
=PROPER("3rd Quarter")
```

This function returns John Doe:

```
=PROPER("JOHN DOE")
```

See Also

LOWER

UPPER

PV

Description

Returns the present value of an annuity

Considers a series of constant payments made over a regular payment period.

Syntax

PV (*interest*, *nper*, *pmt* [, *fv*] [, *type*])

Parameter	Description
interest	The fixed periodic interest rate.
nper	The number of payment periods in the investment.
pmt	The fixed payment made each period.
fv	The future value, or the amount the annuity will be worth. When you omit this argument, a future value of 0 is assumed.
type	Indicates when payments are due. Use 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. When you omit this argument, 0 is assumed.

Remarks

The units used for *interest* must match those used for *nper*. For example, if the annuity has an 8 percent annual interest rate over a period of 5 years, specify 8 percent/12 for *interest* and 5*12 for *nper*.

Cash paid out, such as a payment, is shown as a negative number. Cash received, such as a dividend check, is shown as a positive number.

Examples

This function returns -17999.89:

```
PV(8%/12, 48, 439.43)
```

This function returns 17999.89:

```
PV(8%/12, 48, -439.43)
```

See Also

FV
IPMT
NPER
PMT
PPMT
RATE

RAND

Description

Returns a randomly selected number

Returns a number selected randomly from a uniform distribution greater than or equal to 0 and less than 1.

Syntax

RAND ( )

Remarks

Although **RAND** does not use arguments, you must supply the empty parentheses to correctly reference the function.

Example

This function returns a random number greater than or equal to 0 and less than 10:.

```
RAND()*10
```

RATE

Description

Returns the interest rate per period of an annuity

given a series of constant cash payments made over a regular payment period.

Syntax

RATE (*nper*, *pmt*, *pv* [, *fv*] [, *type*] [, *guess*])

Parameter	Description
nper	The number of periods in the annuity.
pmt	The fixed payment made each period. Generally, *pmt* includes only principle and interest, not taxes or other fees.
pv	The present value of the annuity.
fv	The future value, or the amount the annuity will be worth. When you omit this argument, a future value of 0 is assumed.
type	Indicates when payments are due. Use 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. When you omit this argument, 0 is assumed.
guess	Your estimate of the interest rate. If no argument is supplied, a value of 0.1 (10 percent) is assumed.

Remarks

RATE is calculated iteratively, cycling through the calculation until the result is accurate to .00001 percent. If the result cannot be found after 20 iterations, #NUM! is returned. When this occurs, supply a different value for guess.

Example

The following example returns the monthly interest rate of .0067; the annual interest rate (.0067 multiplied by 12) is 8 percent:

```
RATE(48, –439.43, 18000)
```

See Also

FV

IPMT

NPER

PMT

PPMT

PV

REGISTER.ID

Description

Returns the register ID of the specified DLL that has been previously registered

If the DLL (dynamic link library) has not been registered, this function registers the DLL, and then returns the register ID.

Syntax

REGISTER.ID(*module_text*, *procedure*, *type_text*)

Parameter	Description
module_text	The text specifying the name of the DLL that contains the function in Formula One.
procedure	The text specifying the name of the function in the DLL in Formula One. The function name is case dependent in 32-bit Formula One.
type_text	The text specifying the data type of the return value and the data types of all arguments to the DLL. The first letter of *type_text* specifies the return value. If the function or code resource is already registered, you can omit this argument. For a complete list of the data types available, see the *type_text* parameter of the **CALL** worksheet function.

Remarks

For declarations made in C, it is assumed that your compiler defaults to 8-byte doubles, 2-byte short integers, and 4-byte long integers. In the Windows programming environment, all pointers should be far pointers.

Pascal calling conventions are used for all functions called from DLLs. For most C compilers, you must add the –**Pascal** keyword to the function declaration.

If the return value for your custom function uses a pass-by-reference data type, a null pointer can be passed as the return value. The null pointer is interpreted as the #NUM! error value.

For the F and G data types, a custom function can modify an allocated string buffer. If the return value type code is F or G, the value returned by the function is ignored. The list of function arguments is searched for the first data type that corresponds to the return value type. The current contents of the allocated string buffer is taken for the return value. 256 bytes is allocated for the argument; therefore, a function can return a larger string than it receives.

You can use a single digit (*n*), with a value from 1 to 9, as the code for *data_type*. The variable in the location pointed to by the *n*th argument is modified instead of the return value; this process is referred to as modifying in place. The *n*th argument must be a pass-by-reference data type. In addition, you must declare the function void. For most C compilers, you can add the **Void** keyword to the function declaration.

Example

The following formula registers the GetTickCount function from 32-bit Formula One and returns the register ID:

```
REGISTER.ID("Kernel32", "GetTickCount", "J!")
```

Assuming that GetTickCount was already registered on another sheet using the preceding formula, the following formula returns the register ID for GetTickCount:

```
REGISTER.ID("Kernel32", "GetTickCount")
```

REPLACE

Description

Replaces part of a text string with another text string.

Syntax

REPLACE (*orig_text*, *start_position*, *num_chars*, *repl_text*)

Parameter	Description
orig_text	The original text string.
start_position	The character position where the replacement begins. If *start_position* is greater than the number of characters in *orig_text*, *repl_text* is appended to the end of *orig_text*. If *start_position* is less than 1, #VALUE! is returned.
num_chars	The number of characters to replace. If this argument is negative, #VALUE! is returned.
repl_text	The replacement text string.

Examples

This function returns "For the year: 1994":

```
REPLACE("For the year: 1993", 18, 1, "4")
```

See Also

MID
SEARCH
TRIM

REPLACEB

Description

Replaces part of a text string with another text string.

Syntax

REPLACEB (*orig_text*, *start_position*, *num_bytes*, *repl_text*)

Parameter	Description
orig_text	The original text string.
start_position	The byte position where the replacement begins. If *start_position* is greater than the number of bytes in *orig_text*, *repl_text* is appended to the end of *orig_text*. If *start_position* is less than 1, #VALUE! is returned.
num_bytes	The number of bytes to replace. If this argument is negative, #VALUE! Is returned.
repl_text	The replacement text string.

Remarks

start_position and num_bytes are expressed in bytes, so these values might differ on DBCS systems. On non-DBCS systems, REPLACE and REPLACEB functions are identical, but REPLACEB should only be used in special applications that require distinctions between single-byte and double-byte characters.

Examples

This function returns "For the year: 1994":

```
   REPLACEB("For the year: 1993", 18, 1, "4")
```

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REPT

Description

Repeats a text string the specified number of times.

Syntax

REPT (*text*, *number*)

Parameter	Description
text	Any text string.
number	The number of times you want text to repeat. If number is 0, empty text (" ") is returned.

Remarks

The result of **REPT** cannot exceed 255 characters.

Example

This function returns error-error-error-:

```
REPT("error-", 3)
```

RIGHT

Description

Returns the rightmost characters from the given text string.

Syntax

RIGHT (*text* [, *num_chars*])

Parameter	Description
text	Any text string.
num_chars	The number of characters to return. The value must be greater than or equal to zero. If *num_chars* is greater than the number of characters in *text*, the entire string is returned. Omitting this argument assumes a value of 1.

Examples

This function returns r:

```
RIGHT("2nd Quarter")
```

This function returns Quarter:

```
RIGHT("2nd Quarter", 7)
```

See Also

LEFT
MID

RIGHTB

Description

Returns the rightmost bytes from the given text string.

Syntax

RIGHTB (*text* [, *num_bytes*])

Parameter	Description

text	Any text string.
num_bytes	The number of bytes to return. The value must be greater than or equal to zero. If *num_bytes* is greater than the number of bytes in *text*, the entire string is returned. Omitting this argument assumes a value of 1.

Remarks

Num_bytes is expressed in bytes, so this value might differ on DBCS systems. On non-DBCS systems, RIGHT and RIGHTB functions are identical, but RIGHTB should only be used in special applications that require distinctions between single-byte and double-byte characters.

Examples

This function returns r:

```
RIGHTB("2nd Quarter")
```

This function returns Quarter:

```
RIGHTB("2nd Quarter", 7)
```

ROUND

Description

Rounds the given number to the supplied number of decimal places.

Syntax

ROUND (*number*, *precision*)

Parameter	Description
number	Any value.
precision	The number of decimal places to which number is rounded. When a negative *precision* is used, the digits to the right of the decimal point are dropped and the absolute number of significant digits specified by *precision* are replaced with zeros. If *precision* is 0, number is rounded to the nearest integer.

Example

This function returns 123.46:

```
ROUND(123.456, 2)
```

This function returns 9900:

```
ROUND(9899.435, –2)
```

See Also

- **CEILING**
- **FLOOR**
- **INT**
- **MOD**
- **ROUNDDOWN**
- **ROUNDUP**
- **TRUNC**

ROUNDDOWN

Description

Rounds a number down.

Syntax

ROUNDDOWN (*number*, *numberOfDigits*)

Parameter	Description
number	Any real number you want to round.
numberOfDigits	The number of decimal places to which *number* is rounded. When a negative precision is used, the digits to the right of the decimal point are dropped and the absolute number of significant digits specified by precision are replaced with zeros. If precision is 0, *number* is rounded down to the nearest integer.

Example

This function returns 3.141:

```
ROUNDDOWN(3.14159, 3)
```

This function returns 31400:

```
ROUNDDOWN(31415.92654, -2)
```

See Also

- **CEILING**
- **FLOOR**
- **INT**
- **MOD**
- **ROUNDDOWN**
- **ROUNDUP**
- **TRUNC**

ROUNDUP

Description

Rounds the given number up to the supplied number of decimal places.

Syntax

ROUNDUP (*number*, *numberOfDigits*)

Parameter	Description
number	Any value you want to round up.
numberOfDigits	The number of decimal places to which *number* is rounded. When a negative precision is used, the digits to the right of the decimal point are dropped and the absolute number of significant digits specified by precision are replaced with zeros. If precision is 0, number is rounded up to the nearest integer.

Example

This function returns 77:

```
ROUNDUP(76.9,0)
```

This function returns 31500:

```
ROUNDUP(31415.92654, -2)
```

See Also

- **CEILING**
- **FLOOR**
- **INT**
- **MOD**
- **ROUND**
- **ROUNDDOWN**
- **TRUNC**

ROW

Description

Returns the row number of the supplied reference.

Syntax

ROW (*reference*)

Parameter	Description

reference	A cell or range reference. Omitting this argument returns the row number of the cell in which **ROW** is entered.

Examples

This function returns 3:

```
ROW(B3)
```

See Also

COLUMN

ROWS

ROWS

Description

Returns the number of rows in a range reference.

Syntax

ROWS (*range*)

Parameter	Description
range	A reference to a range of cells.

Examples

This function returns 5:

```
ROWS(A1:D5)
```

This function returns 6:

```
ROWS(C30:F35)
```

See Also

COLUMNS

ROW

SEARCH

Description

Locates the position of the first character of a specified text string within another text string.

Syntax

SEARCH (*search_text*, *text* [, *start_position*])

Parameter	Description

search_text	The text to find. To search for an asterisk or question mark, include a tilde (~) before the character. The search string can contain wildcard characters. The available wildcard characters are * (asterisk), which matches any sequence of characters, and ? (question mark), which matches any single character.
text	The text to be searched.
start_position	The character position where the search begins. If the number you specify is less than 0 or greater than the number of characters in text, #VALUE! is returned. Omitting this argument assumes a starting position of 1.

Remarks

Text is searched from left to right, starting at the position specified. The search is not case-sensitive. If *text* does not contain the search string, #VALUE! is returned.

Examples

This function returns 6:

```
SEARCH("?5", "Bin b45")
```

This function returns 5:

```
SEARCH("b", "Bin b45", 4)
```

See Also

- FIND
- MID
- REPLACE
- SUBSTITUTE

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SEARCHB

Description

Locates the position of the first byte of a specified text string within another text string.

Syntax

SEARCHB (*search_text*, *text* [, *start_position*])

Parameter	Description
search_text	The text to find. To search for an asterisk or question mark, include a tilde (~) before the character. The search string can contain wildcards. The available wildcard characters are * (asterisk), which matches any sequence of characters, and ? (question mark), which matches any single character.

Text	The text to be searched.
start_position	The byte position where the search begins. If the number you specify is less than 0 or greater than the number of bytes in text, #VALUE! is returned. Omitting this argument assumes a starting position of 1.

Remarks

Text is searched from left to right, starting at the position specified. The search is not case-sensitive. If *text* does not contain the search string, #VALUE! is returned.

start_position is expressed in bytes, so this value might differ on DBCS systems. On non-DBCS systems, SEARCH and SEARCHB functions are identical, but SEARCHB should only be used in special applications that require distinctions between single-byte and double-byte characters.

Examples

This function returns 6:

```
SEARCHB("?5", "Bin b45")
```

This function returns 5:

```
SEARCHB("b", "Bin b45", 4)
```

SECOND

Description

Returns the second that corresponds to the supplied date.

Syntax

SECOND (*serial_number*)

Parameter	Description
serial_number	The time as a serial number. The decimal portion of the number represents time as a fraction of the day.

Examples

This function returns 58:

```
SECOND(.259)
```

This function returns 46:

```
SECOND(34657.904)
```

See Also

DAY

HOUR

MINUTE

MONTH
NOW
WEEKDAY

SIGN

Description

Determines the sign of the specified number.

Syntax

SIGN (*number*)

Parameter	Description
number	Any number.

Remarks

SIGN returns 1 if the specified number is positive, -1 if it is negative, and 0 if it is 0.

Examples

This function returns -1:

```
SIGN(–123)
```

This function returns 1:

```
SIGN(123)
```

See Also

ABS

SIN

Description

Returns the sine of the supplied angle.

Syntax

SIN (*number*)

Parameter	Description
number	The angle in radians. If the angle is in degrees, convert the angle to radians by multiplying the angle by PI( )/180.

Examples

This function returns .85:

```
SIN(45)
```

This function returns .89:

```
SIN(90)
```

See Also

- ASIN
- PI

SINH

Description

Returns the hyperbolic sine of the specified number.

Syntax

SINH (*number*)

Parameter	Description
number	Any number.

Examples

This function returns 1.18:

```
SINH(1)
```

This function returns 10.02:

```
SINH(3)
```

See Also

- ASINH
- PI

SLN

Description

Returns the depreciation of an asset for a specific period of time

Uses the straight-line balance method.

Syntax

SLN (*cost*, *salvage*, *life*)

Parameter	Description
cost	The initial cost of the asset.
salvage	The salvage value of the asset.
life	The number of periods of the useful life of the asset.

Example

This function returns 1285.71:

```
SLN(10000, 1000, 7)
```

See Also

DDB

SYD

VDB

SQRT

Description

Returns the square root of the specified number.

Syntax

SQRT (*number*)

Parameter	Description
number	Any positive number. If you specify a negative number, the error #NUM! is returned.

Examples

This function returns 3:

```
SQRT(9)
```

This function returns 1.58:

```
SQRT(2.5)
```

See Also

SUMSQ

STDEV

Description

Returns the standard deviation of a population based on a sample of supplied values.

The standard deviation of a population represents an average of deviations from the population mean within a list of values.

Syntax

STDEV (*number_list*)

Parameter	Description
number_list	A list of as many as 30 numbers, separated by commas. The

	list can contain numbers or a reference to a range that contains numbers.

Example

This function returns .56:

```
STDEV(4.0, 3.0, 3.0, 3.5, 2.5, 4.0, 3.5)
```

See Also

STDEVP

VAR

VARP

STDEVP

Description

Returns the standard deviation of a population based on an entire population of values.

The standard deviation of a population represents an average of deviations from the population mean within a list of values.

Syntax

STDEVP (*number_list*)

Parameter	Description
number_list	A list of as many as 30 numbers, separated by commas. The list can contain numbers or a reference to a range that contains numbers.

Example

This function returns .52:

```
STDEVP(4.0, 3.0, 3.0, 3.5, 2.5, 4.0, 3.5)
```

See Also

STDEV

VAR

VARP

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SUBSTITUTE

Description

Replaces a specified part of a text string with another text string.

Syntax

SUBSTITUTE (*text*, *old_text*, *new_text* [, *instance*])

Parameter	Description
text	A text string that contains the text to replace. You can also specify a reference to a cell that contains text.
old_text	The text string to be replaced.
new_text	The replacement text.
instance	Specifies the occurrence of *old_text* to replace. If this argument is omitted, every instance of *old_text* is replaced.

Examples

This function returns "Second Quarter Results":

```
SUBSTITUTE("First Quarter Results", "First", "Second")
```

This function returns "Shipment 45, Bin 52":

```
SUBSTITUTE("Shipment 45, Bin 45", "45", "52", 2)
```

See Also

REPLACE

TRIM

SUM

Description

Returns the sum of the supplied numbers.

Syntax

SUM (*number_list*)

Parameter	Description
number_list	A list of as many as 30 numbers, separated by commas. The list can contain numbers, logical values, text representations of numbers, or a reference to a range containing those values. Error values or text that cannot be translated into numbers return errors. If a range reference is included in the list, text, logical expressions, and empty cells in the range are ignored.

Examples

This function returns 6000:

```
SUM(1000, 2000, 3000)
```

This function returns 4000 when each cell in the range contains 1000:

```
SUM(A10:D10)
```

See Also

- AVERAGE
- COUNT
- COUNTA
- PRODUCT
- SUMSQ

SUMIF

Description

Returns the sum of the specified cells based on the given criteria.

Syntax

SUMIF (*range*, *criteria*, *sum_range*)

Parameter	Description
range	The range of cells you want evaluated.
criteria	A number, expression, or text that defines which cells are added. For example, *criteria* can be expressed as 15, "15", ">15", "cars".
sum_range	The actual cells to sum. These cells are only summed if their corresponding cells in range match the criteria. If this argument is omitted, the cells in range are summed.

See Also

- AVERAGE
- COUNT
- COUNTA
- COUNTIF
- PRODUCT
- SUM

SUMPRODUCT

Description

Multiplies the corresponding cells in the given ranges

The function then returns the sum of those products.

Syntax

SUMPRODUCT (*range1,range2*)

Parameter	Description

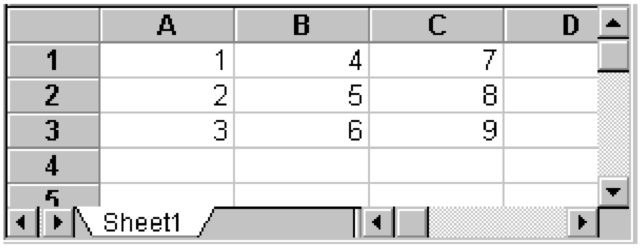
range1	The range of cells that provides the first number you want to multiply. The first cell in this range is multiplied with the first cell in range2, then all the products are summed.
range2	The range of cells that provide the second number you want to multiply.

Remarks

Range1 must contain the same number of cells in the same arrangement as *range2*. That is, if *range1* is three rows deep and three columns wide, *range2* must also be three rows deep and three columns wide.

Examples

The following examples use this worksheet.



	A	B	C	D
1	1	4	7	
2	2	5	8	
3	3	6	9	
4				
5				

This function returns 32:

```
SUMPRODUCT(A1.A3,B1.B3)
```

That is, 1 x 4 = 4
2 x 5 = 10
3 x 6 = 18
32

This function returns 50:

```
SUMPRODUCT(A1.A3,C1.C3)
```

This function returns 122:

```
SUMPRODUCT(B1.B3,C1.C3)
```

SUMSQ

Description

Squares each of the supplied numbers and returns the sum of the squares.

Syntax

SUMSQ (*number_list*)

Parameter	Description

number_list	A list of as many as 30 numbers, separated by commas. The list can contain numbers, logical values, text representations of numbers, or a reference to a range containing those values. Error values or text that cannot be translated into numbers return errors. If a range reference is included in the list, text, logical expressions, and empty cells in the range are ignored.

Example

This function returns 302:

```
SUMSQ(9, 10, 11)
```

See Also

SUM

SYD

Description

Returns the depreciation of an asset for a specified period using the sum-of-years method

This depreciation method uses an accelerated rate, where the greatest depreciation occurs early in the useful life of the asset.

Syntax

SYD (*cost*, *salvage*, *life*, *period*)

Parameter	Description
cost	The initial cost of the asset.
salvage	The salvage value of the asset.
life	The number of periods in the useful life of the asset.
period	The period for which to calculate the depreciation. The time units used to determine *per* and *life* must match.

Example

This function returns 1607.14:

```
SYD(10000, 1000, 7, 3)
```

See Also

DDB

SLN

VDB

T

Description

Tests the supplied value and returns the value if it is text.

Syntax

T (*value*)

Parameter	Description
value	The value to test.

Remarks

Empty text (" ") is returned for any *value* that is not text.

Examples

This function returns Report:

```
T("Report")
```

This function returns empty text (" ") if A4 contains a number:

```
T(A4)
```

See Also

N
VALUE

TAN

Description

Returns the tangent of the specified angle.

Syntax

TAN (*number*)

Parameter	Description
number	The angle in radians. To convert a number expressed as degrees to radians, multiply the degrees by PI( )/180.

Example

This function returns 0.752:

```
TAN(0.645)
```

This function returns 1:

```
TAN(45*PI()/180)
```

See Also

- ATAN
- ATAN2
- PI
- TANH

TANH

Description

Returns the hyperbolic tangent of a number.

Syntax

TANH (*number*)

Parameter	Description
number	Any number.

Examples

This function returns -.96:

```
TANH(-2)
```

This function returns .83:

```
TANH(1.2)
```

See Also

- ATANH
- COSH
- SINH
- TAN

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TEXT

Description

Returns the given number as text, using the specified formatting.

Syntax

TEXT (*number*, *format*)

Parameter	Description
number	Any value, a formula that evaluates to a number, or a reference to a cell that contains a value.

format	A string representing a number format. The string can be any valid format string including “General,” “M/DD/YY,” or “H:MM AM/PM.” The *format* must be surrounded by a set of double quotation marks. Asterisks cannot be included in *format*.

Examples

This function returns 123.620:

```
TEXT(123.62, "0.000")
```

This function returns 10/19/94:

```
TEXT(34626.2, "MM/DD/YY")
```

See Also

- **DOLLAR**
- **FIXED**
- **T**
- **VALUE**

TIME

Description

Returns a serial number for the supplied time.

Syntax

TIME (*hour*, *minute*, *second*)

Parameter	Description
hour	A number from 0 to 23.
minute	A number from 0 to 59.
second	A number from 0 to 59.

Examples

This function returns .52:

```
TIME(12, 26, 24)
```

This function returns .07:

```
TIME(1, 43, 34)
```

See Also

- **HOUR**
- **MINUTE**
- **NOW**
- **SECOND**

TIMEVALUE

TIMEVALUE

Description

Returns a serial number for the supplied text representation of time.

Syntax

TIMEVALUE (*text*)

Parameter	Description
text	A time in text format.

Examples

This function returns .07:

```
TIMEVALUE("1:43:43 am")
```

This function returns .59:

```
TIMEVALUE("14:10:07")
```

See Also

HOUR
MINUTE
NOW
SECOND
TIME

TODAY

Description

Returns the current date as a serial number.

Syntax

TODAY ( )

Remarks

This function is updated only when the worksheet is recalculated.

See Also

DATE
DAY
NOW

TRIM

Description

Removes all spaces from text except single spaces between words.

Syntax

TRIM (*text*)

Parameter	Description
text	Any text string or a reference to a cell that contains a text string.

Remarks

Text that is imported from another environment may require this function.

Example

This function returns Level 3, Gate 45:

```
TRIM(" Level 3, Gate 45 ")
```

See Also

CLEAN
MID
REPLACE
SUBSTITUTE

TRUE

Description

Returns the logical value True

This function always requires the trailing parentheses.

Syntax

TRUE ( )

See Also

FALSE

TRUNC

Description

Truncates the given number to an integer.

Syntax

TRUNC (*number* [, *precision*])

Parameter	Description
number	Any value.
precision	The number of decimal places allowed in the truncated number. Omitting this argument assumes a precision of 0.

Remarks

TRUNC removes the fractional part of a number to the specified precision without rounding the number.

Example

This function returns 123.45:

```
TRUNC(123.456, 2)
```

This function returns 9800:

```
TRUNC(9899.435, –2)
```

See Also

- **CEILING**
- **FLOOR**
- **INT**
- **MOD**
- **ROUND**

TYPE

Description

Returns the argument type of the given expression.

Syntax

TYPE (*expression*)

Parameter	Description
expression	Any expression.

Remarks

The valid values returned by this argument are:

Number	Description
1	Number
2	Text string
4	Logical value
16	Error value

Examples

This function returns 1 if cell A1 contains a number:

```
TYPE(A1)
```

This function returns 2:

```
TYPE("Customer")
```

See Also

- ISBLANK
- ISERR
- ISERROR
- ISLOGICAL
- ISNA
- ISNONTEXT
- ISNUMBER
- ISREF
- ISTEXT

UPPER

Description

Changes the characters in the specified string to uppercase characters.

Syntax

UPPER (*text*)

Parameter	Description
text	Any string.

Remarks

Numeric characters in the string are not changed.

Examples

This function returns 3RD QUARTER:

```
UPPER("3rd Quarter")
```

This function returns JOHN DOE:

```
UPPER("JOHN DOE")
```

See Also

- LOWER
- PROPER

USDOLLAR

Description

Returns the specified number as text using the US Dollar format and the supplied precision

Omitting the precision argument assumes two decimal places.

Syntax

USDOLLAR (*number* [,*precision*])

Parameter	Description
number	A number, a formula that evaluates to a number, or a reference to a cell that contains a number.
precision	A value representing the number of decimal places to the right of the decimal point. Omitting this argument assumes two decimal places.

See Also

DOLLAR

# VALUE

Description

Returns the specified text as a number.

Syntax

VALUE (*text*)

Parameter	Description
text	Any text string, a formula that evaluates to a text string, or a cell reference that contains a text string. You can also specify a date or time in a recognizable format (for example, M/DD/YY for dates or H:MM AM/PM for time). If the format is not recognized, #VALUE! is returned.

Examples

This function returns 9800:

```
VALUE(9800)
```

This function returns 123:

```
VALUE("123")
```

See Also

DOLLAR
FIXED
TEXT

VAR

Description

Returns the variance of a population based on a sample of values.

Syntax

VAR (*number_list*)

Parameter	Description
number_list	A list of as many as 30 numbers, separated by commas. The list can contain numbers or a reference to a range that contains numbers.

Example

This function returns .31:

```
VAR(4.0, 3.0, 3.0, 3.5, 2.5, 4.0, 3.5)
```

See Also

STDEV
STDEVP
VARP

VARP

Description

Returns the variance of a population based on an entire population of values.

Syntax

VARP (*number_list*)

Parameter	Description
number_list	A list of as many as 30 numbers, separated by commas. The list can contain numbers or a reference to a range that contains numbers.

Example

This function returns .27:

```
VARP(4.0, 3.0, 3.0, 3.5, 2.5, 4.0, 3.5)
```

See Also

STDEV
STDEVP
VAR

VDB

Description

Returns the depreciation of an asset for a specified period using a variable method of depreciation.

Syntax

VDB (*cost*, *salvage*, *life*, *start_period*, *end_period* [, *factor*] [, *method*])

Parameter	Description
cost	The initial cost of the asset.
salvage	The salvage value of the asset.
life	The number of periods in the useful life of the asset.
start_period	The beginning period for which to calculate the depreciation. The time units used to determine *start_period* and *life* must match.
end_period	The ending period for which to calculate the depreciation. The time units used to determine *end_period* and *life* must match.
factor	The rate at which the balance declines. Omitting this argument assumes a default of 2, which is the double-declining balance factor.
method	A logical value that determines if you want to switch to straight-line depreciation when depreciation is greater than the declining balance calculation. Use True to maintain declining balance calculation; use False or omit the argument to switch to straight-line depreciation calculation.

Example

This function returns 1041.23:

```
VDB(10000, 1000, 7, 3, 4)
```

See Also

DDB
SLN
SYD

VLOOKUP

Description

Searches the first column of a table for a value and returns the contents of a cell in that table that corresponds to the location of the search value.

Syntax

VLOOKUP (*search_item*, *search_range*, *column_index*)

Parameter	Description
search_item	A value, text string, or reference to a cell containing a value that is matched against data in the top row of *search_range*.
search_range	The reference of the range (table) to be searched. The cells in the first column of *search_range* can contain numbers, text, or logical values. The contents of the first column must be in ascending order (for example, -2, -1, 0, 2..., A through Z, False, True). Text searches are not case-sensitive.
column_index	The column in the search range from which the matching value is returned. *column_index* can be a number from 1 to the number of rows in the search range. If *column_index* is less than 1, #VALUE! is returned. When *column_index* is greater than the number of rows in the table, #REF! is returned.

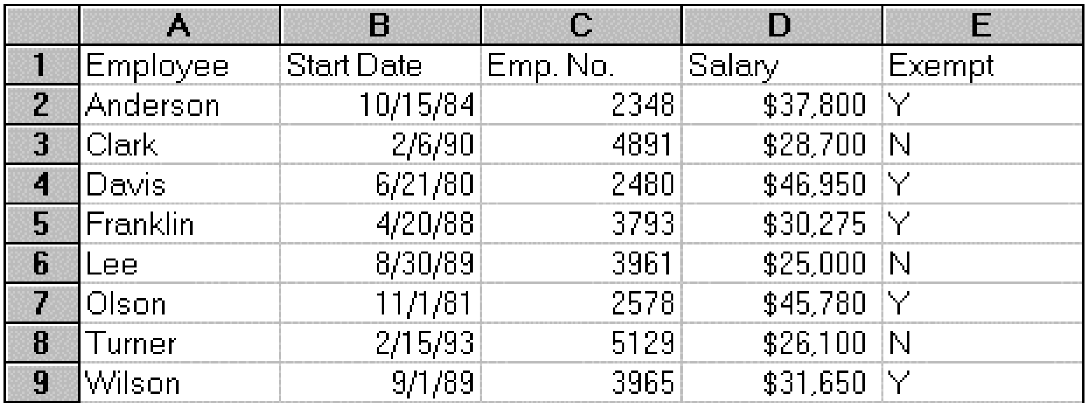
Remarks

VLOOKUP compares the information in the first column of *search_range* to the supplied *search_item*. When a match is found, information located in the same row and supplied column (*column _index*) is returned.

If *search_item* cannot be found in the first column of *search_range*, the largest value that is less than *search_item* is used. When *search_item* is less than the smallest value in the first column of the *search_range*, #REF! is returned.

Examples

The following examples use this worksheet.



	A	B	C	D	E
1	Employee	Start Date	Emp. No.	Salary	Exempt
2	Anderson	10/15/84	2348	$37,800	Y
3	Clark	2/6/90	4891	$28,700	N
4	Davis	6/21/80	2480	$46,950	Y
5	Franklin	4/20/88	3793	$30,275	Y
6	Lee	8/30/89	3961	$25,000	N
7	Olson	11/1/81	2578	$45,780	Y
8	Turner	2/15/93	5129	$26,100	N
9	Wilson	9/1/89	3965	$31,650	Y

This function returns $28,700:

```
VLOOKUP("Clark", A2:E9, 4)
```

This function returns 3961:

```
VLOOKUP("Lee", A2:E9, 3)
```

See Also

- **HLOOKUP**
- **INDEX**
- **LOOKUP**
- **MATCH**

WEEKDAY

Description

Returns the day of the week that corresponds to the supplied date.

Syntax

WEEKDAY (*serial_number*)

Parameter	Description
serial_number	The date as a serial number or as text (for example, 06-21-94 or 21-Jun-94).

Remarks

WEEKDAY returns a number ranging from 1 (Sunday) to 7 (Saturday).

Examples

This function returns 1, indicating Sunday:

```
WEEKDAY(34399.92)
```

This function returns 3, indicating Tuesday:

```
WEEKDAY("06/21/94")
```

See Also

- **DAY**
- **NOW**
- **TEXT**
- **TODAY**

YEAR

Description

Returns the year that corresponds to the supplied date.

Syntax

YEAR (*serial_number*)

Parameter	Description
serial_number	The date as a serial number or as text (for example, 06-21-94 or 21-Jun-94).

Examples

This function returns 1993:

```
YEAR(34328)
```

This function returns 1994:

```
YEAR("06/21/94")
```

See Also

- **DAY**
- **HOUR**
- **MINUTE**
- **MONTH**
- **NOW**
- **SECOND**
- **TODAY**
- **WEEKDAY**

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