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# SCIEX OS Software

## Calculated Columns

### Feature Guide



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AB Sciex Pte. Ltd.  
Blk33, #04-06 Marsiling Industrial Estate Road 3  
Woodlands Central Industrial Estate, Singapore 739256

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Calculated columns are columns that are created with either a formula or a conditional lookup table. Calculated columns are created in a processing method.

During processing, the formulas and conditional lookup tables are applied, and the results are shown in custom columns in the Results Table.

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**Note:** If a calculated column that was created in an earlier version of the SCIEX OS is in use, then review the results to make sure that they are correct.

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This document shows how to use the calculated column feature.

# Formulas

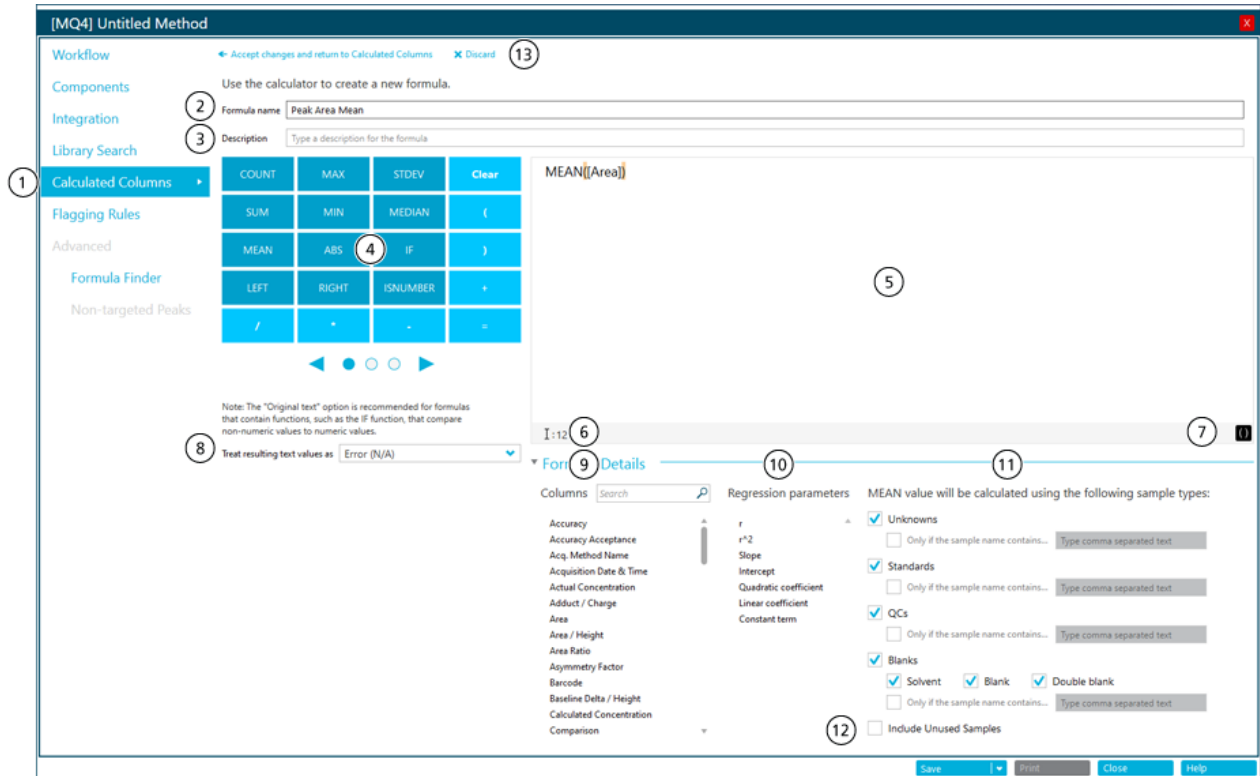
# 2

**Note:** Formulas can be imported and exported as `f_rml` files for later use or sharing.

## Formula Editor

The following figure shows the interface for the formula editor.

**Figure 2-1 Formula Page**



Item	Description
1	The <b>Calculated Columns</b> step in the workflow of the processing method. Click to open the Calculated Columns page, and then click <b>Add &gt; Formula</b> .

## Formulas

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Item	Description
2	<p>The <b>Formula name</b> field. Type a name for the formula.</p> <hr/> <p><b>Note:</b> The formula name cannot contain square brackets, or rounded brackets, and it must not be the same as the name of a function.</p> <hr/> <p><b>Note:</b> After a formula is used in a flagging rule or another formula, the name of the formula cannot be changed.</p> <hr/> <p><b>Tip!</b> After processing, the formula is added as a column in the Results Table. The column header is the name of the formula. For best use of screen space, we recommend that formula names be kept short. Detailed information can be included in the <b>Description</b> field.</p> <hr/> <p><b>Tip!</b> For a calculation that has more than one formula, use meaningful prefixes and numbers to identify the sequence in which the formulas are used.</p> <hr/>
3	<p>The <b>Description</b> field. The description is shown on the Calculated Columns page.</p> <hr/> <p><b>Tip!</b> If possible, then include the formula in the <b>Description</b>. It will not be necessary for the user to open the formula to see its contents.</p> <hr/>
4	<p>A calculator that contains commonly used functions and operators. Refer to the sections: <a href="#">Formula Reference</a> and <a href="#">Operators</a>.</p>
5	<p>The <b>Formula</b> field. Type or select the functions, operators, columns, and values to be used in the formulas.</p>
6	<p>Validation section. If the <b>Formula</b> field contains errors, then an error message is shown in this section. The message identifies the position at which the error occurred. For example, if the user enters the following formula:</p> <pre>IFS([Sample Type] == 'Standard'; 'Yes'; 'No')</pre> <p>then the following error message would be shown:</p> <pre>The Formula contains an invalid function at position 1: IFS.</pre>
7	<p>An option to apply highlighting to parentheses in the <b>Formula</b> field.</p>

Item	Description
8	A set of options that control what is done with text entries. The <b>Treat resulting text values as</b> field is important in Results Table columns that might contain both numeric and text outputs, for example N/A, degenerate, <0, <0, >0, not enough points, less than <i>n</i> points, and the symbol for infinity. For more information, refer to the section: <a href="#">The Treat resulting text values as Option</a>
9	Available Results Table columns. Click a column to add it to the formula field.
10	Available regression parameters. Click a parameter to add it to the formula field.  <b>Note:</b> Regression parameters are only shown in the Calibration Curve pane. They are not included as columns in the Results Table.  <b>Note:</b> Regression parameters are only supported in calculated columns for linear, linear through zero, quadratic, and quadratic through zero regression types. They are not supported for <b>Power, Wagner, Hill, or Mean Response Factor</b> regression types.
11	Available sample types. Select the types of samples on which the function will operate.  <b>Note:</b> This section is shown for aggregate functions, that is functions that operate on multiple rows.
12	Option to include samples for which the <b>Use</b> check box is not selected.  <b>Note:</b> This section is shown for aggregate functions. By default, only rows with the <b>Use</b> check box selected are included in calculations that use aggregate functions.
13	Options to save or discard the formula.

## Simple Arithmetic

Simple formulas can be created to do basic mathematical operations.

**Example: R<sup>2</sup>**

[r] \* [r]

## Formulas

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In this example, the multiplication operator (\*) is used to multiply the R-value by itself to calculate the R<sup>2</sup> value.

### Example: Points Per Second Collected

```
[Points Across Baseline]/(([End Time]-[Start Time])*60)
```

In this example, the points across the baseline are divided by the seconds from the start to the end of an integrated chromatographic peak. This formula uses the division (/), multiplication (\*), and subtraction (-) operators.

## More Complex Functions

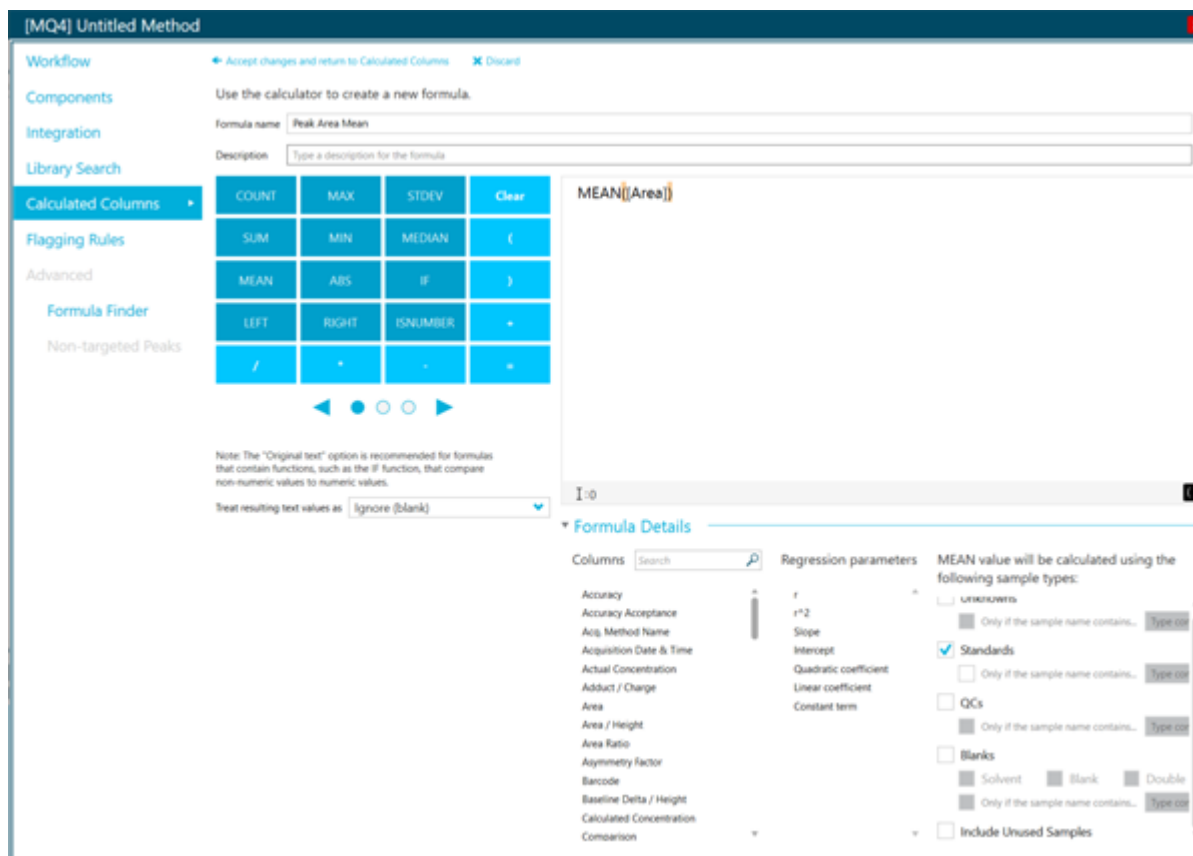
Many other functions and control structures are available. Some common functions, such as **MEAN**, **MAX**, and **MIN**, are shown in the calculator under the formula bar. For a complete list of syntax details, operators, and functions, press **F1** on the formula editor page.

### Example: MEAN([Area]) for Standards

When a function that operates on all values is used, the user can select the samples to be included in the calculation.



Figure 2-2 Get the Mean of the Peak Area of Standard Samples Only



### Example: Put Functions Together

Simple arithmetic and more complex functions can be put together. For example, to calculate the mean points per second collected, use the following formula:

```
MEAN([Points Across Baseline]/(([End Time]-[Start Time])*60))
```

**Note:** The combination of aggregate functions is not recommended. Create a separate column for each aggregate function, and then create a formula that uses those columns.

## IF Function

The **IF** function does a logical test and then gives a `true` or `false` result. Use nested **IF** functions to test more than one condition. The **IF** function can be used with other logical functions, such as **and** and **or** to extend a logical test.

The basic **IF** statement syntax is as follows:

## Formulas

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**IF**(*condition*; *value if true*; *value if false*)

Where:

- *condition* is a value or logical expression that can be found to be true or false.
- *value if true* is a value to be shown in the related Results Table column when the *condition* is true.
- *value if false* is a value to be shown in the related Results Table column when *condition* is false.

---

**Note:** The characters && and || can be used for **and** and **or**, respectively. The **and** and **or** operators must be surrounded by spaces, but the && and || operators do not.

---

**Note:** The **IF** function symbol can be selected from the calculator, typed, or copied from another source. The **IF** function is not case sensitive.

---

**Note:** In **IF** statements with more than one *<condition>*, if the user does not evaluate even one *<condition>*, then a *<value if false>* output is shown in the custom column in the Results Table.

---

The **IF** function also lets other numeric functions, such as **Mean** and **STDEV**, be used in the formula, in the *condition*, *value if true*, or *value if false* expressions.

### **condition**

Some examples of a *condition* include:

```
[Area]>5000
```

```
[Component Name]='Analyte 1'
```

```
[Retention Time]> 1 and [Retention Time]<2
```

### **value if true and value if false**

The *value if true* and *value if false* can be numeric or text.

```
if([Retention Time]> 1 and [Retention Time]<2; '1-2 min RT window';  
'not applicable')
```

---

**Note:** Line breaks are not valid in formulas. If an example formula is pasted into the formula field, then remove the line breaks.

---

## Operators

**Table 2-1 Operators (Included on the Calculator)**

Operator	Description
/	Divides the value before the operator by the value after the operator.
*	Multiplies the value before the operator by the value after the operator.
-	Subtracts the value before the operator from the value after the operator.
=	Shows the output of the function.
+	Adds the value before the operator to the value after the operator.
()	Specifies the order of operation. Put calculations to be done first in parentheses.

**Table 2-2 Comparison and Logical Operators (Can Be Typed Manually)**

Operator	Description
<	If the value before the operator is less than the value after the operator, then the result is <code>true</code> . Otherwise, the result is <code>false</code> .
<=	If the value before the operator is less than or equal to the value after the operator, then the result is <code>true</code> . Otherwise, the result is <code>false</code> .
>	If the value before the operator is more than the value after the operator, then the result is <code>true</code> . Otherwise, the result is <code>false</code> .
>=	If the value before the operator is more than or equal to the value after the operator, then the result is <code>true</code> . Otherwise, the result is <code>false</code> .
!=	If the value before the operator is not equal to the following value, then the result is <code>true</code> . Otherwise, the result is <code>false</code> .
&&	If the expressions before and after the operator are both true, then the result is <code>true</code> . If one or both expressions are false, then the result is <code>false</code> . Character representation of the Boolean <b>and</b> operator. <b>&amp;&amp;</b> , <b>and</b> , or both can be used in formulas.
	If the expression before or after the operator is true, then the result is <code>true</code> . If both expressions are false, then the result is <code>false</code> . Character representation of the Boolean <b>or</b> operator. <b>  </b> , <b>or</b> , or both can be used in formulas.

**Table 2-2 Comparison and Logical Operators (Can Be Typed Manually) (continued)**

Operator	Description
<b>true</b>	For columns that contain check boxes, identifies columns for which the check box is selected. Example <sup>1</sup> : <b>IF</b> ([Sample Type] = 'Standard'&&[Used] = true&&[Reportable] = true; 'Qualified STD reported'; '')
<b>false</b>	For columns that contain check boxes, identifies columns for which the check box is cleared.

## The Treat resulting text values as Option

The **Treat resulting text values as** option controls how text is interpreted in a custom Results Table column that contains text or a combination of numbers and text. For example, the **Sample Type** column contains only text, the **Precursor Mass** column contains only numeric values, and the **Calculated Concentration** column might contain both numeric values and text.

For each formula, the user can set the **Treat resulting text values as** option to the value that is applicable to the functions used in that formula. The following values are available:

- **Zero**
- **Ignore (blank)**
- **Error (N/A)**
- **Original text**

---

**Note:** For more information about these options, refer to the document: *Help System*.

---

If calculations are made with the following functions, then the recommended options are **Zero**, **Ignore (blank)**, or **Error (N/A)**: **COUNT**, **MAX**, **STDEV**, **SUM**, **MIN**, **MEDIAN**, **GET**, **GETGROUP**, **SLOPE**, **INTERCEPT**, **MAD**, **GETSTAT**, **GETSAMPLECLOSEST**, **GETSAMPLECLOSESTHIGH**, **GETSAMPLECLOSESTLOW**, or **GETSAMPLEEQUAL**. These options are also recommended in **IF** statements when the formula contains columns that might have numeric values.

The recommended option for the concatenation of text values is **Original text**.

---

<sup>1</sup> Line breaks are not valid in formulas. If a formula is pasted into the formula field, then remove the line breaks.

### Example

This example concatenates two columns that contain text values. For this case, the **Original text** option is recommended.

```
[Sample Name] + ' ' + [Sample Type]
```

This formula adds a summary column that contains the name of the sample and its type. For example, if the sample name is *Calibrator 1* and the type is *Standard*, then the calculated column contains *Calibrator 1 Standard*. For this formula, **Treat resulting text values as** is set to **Original text**.

The ' ' adds a space.

## Simple Extraction of Nondefault Information

The calculated columns feature lets users show information that is not available by default in Results Tables.

For example, to show  $R^2$  as a column in the Results Table, click  **$R^2$**  in the **Regression parameters** list.

## Formulas

Figure 2-3 Create a Custom Column with Calculated Columns

[MQ4] Modify Method

Workflow ← Accept changes and return to Calculated Columns ✕ Discard

Components

Integration

Library Search

Calculated Columns ▶

Flagging Rules

Advanced

Formula Finder

Non-targeted Peaks

Use the calculator to create a new formula.

Formula name:

Description:

COUNT	MAX	STDEV	Clear
SUM	MIN	MEDIAN	(
MEAN	ABS	IF	)
LEFT	RIGHT	ISNUMBER	+
/	*	-	=

◀ ● ○ ○ ▶

Note: The "Original text" option is recommended for formulas that contain functions, such as the IF function, that compare non-numeric values to numeric values.

Treat resulting text values as:

Formula Editor:

Formula Details

Columns

- Accuracy
- Accuracy Acceptance
- Acq. Method Name
- Acquisition Date & Time
- Actual Concentration
- Adduct / Charge
- Area
- Area / Height
- Area Ratio
- Area Ratio of comparison
- Asymmetry Factor
- Barcode
- Baseline Delta / Height
- Calculated Concentration

Regression parameters

- r
- r^2
- Slope
- Intercept
- Quadratic coefficient
- Linear coefficient
- Constant term

Process & Close Print Close Help

# Examples: Formulas

## GET Functions

Find the Ion Ratio of the Standard Nearest in Area to the Unknown Sample (GETSAMPLECLOSEST)

Figure 2-4 Formula: Ref MRM Ratio

← Accept changes and return to Calculated Columns    ✕ Discard

Formula name: Ref MRM Ratio

Description: Find ion ratio of a standard closest in area to unknown sample

GETSAMPLECLOSEST([Ion Ratio];[Area])

Formula Details

Columns: Search

Regression parameters

GETSAMPLECLOSEST value will be calculated using the following sample types:

- Unknowns
  - Only if the sample name contains... Type comma separated text
- Standards
  - Only if the sample name contains... Type comma separated text
- QCs
  - Only if the sample name contains... Type comma separated text
- Blanks
  - Solvent    Blank    Double blank
  - Only if the sample name contains... Type comma separated text

Treat resulting text values as: Error (N/A)

Process & Close    Print    Close    Help

**Note:** The following table gives a summary of the settings shown in the preceding figure.

## Formulas

**Table 2-3 Settings**

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Ref MRM Ratio	<code>GETSAMPLECLOSEST([Ion Ratio]; [Area])</code>	The ion ratio of a standard that is nearest in area to the other samples. Refer to column 1 in the figure: <a href="#">Figure 2-5</a> .	Standards	Error (N/A)	No

**Figure 2-5 Results Table: Calculated Columns with Ref MRM Ratio, High Ref MRM Ratio, Low Ref MRM Ratio, Equal Ref MRM Ratio**

								①	②	③	④	
Index	Sample Name	Sample Type	Component Name	Component Type	Component Group Name	Area	Ion Ratio	*Ref MRM Ratio	*High Ref MRM Ratio	*Low Ref MRM Ratio	*Equal Ref MRM Ratio	Actual Concentrat...
1	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	9.172e1	0.782	1.177	1.177	N/A	N/A	N/A
7	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	6.818e2	0.536	1.177	1.177	N/A	N/A	N/A
13	STD_01	Standard	vitd3 1	Quantifiers	vitd3	9.501e3	1.177	1.177	1.177	1.177	1.177	4.50
19	STD_02	Standard	vitd3 1	Quantifiers	vitd3	5.679e4	1.128	1.128	1.128	1.128	1.128	18.76
25	STD_03	Standard	vitd3 1	Quantifiers	vitd3	1.128e5	1.217	1.217	1.217	1.217	1.217	37.50
31	STD_04	Standard	vitd3 1	Quantifiers	vitd3	1.709e5	1.130	1.130	1.130	1.130	1.130	75.00
37	STD_05	Standard	vitd3 1	Quantifiers	vitd3	2.099e5	1.153	1.153	1.153	1.153	1.153	112.50
43	STD_06	Standard	vitd3 1	Quantifiers	vitd3	2.806e5	1.196	1.196	1.196	1.196	1.196	150.00
49	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	6.084e2	0.858	1.177	1.177	N/A	N/A	N/A
163	2920810037	Unknown	vitd3 1	Quantifiers	vitd3	5.721e4	1.159	1.128	1.217	1.128	N/A	N/A
169	2120910317	Unknown	vitd3 1	Quantifiers	vitd3	1.039e5	1.087	1.217	1.217	1.128	N/A	N/A
175	1320702698	Unknown	vitd3 1	Quantifiers	vitd3	5.332e4	1.178	1.128	1.128	1.177	N/A	N/A
181	4420804700	Unknown	vitd3 1	Quantifiers	vitd3	4.264e4	1.212	1.128	1.128	1.177	N/A	N/A



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**GETSAMPLECLOSESTHIGH, GETSAMPLECLOSESTLOW, and GETSAMPLEEQUAL**
**Table 2-4 Settings**

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
High Ref MRM Ratio	<b>GETSAMPLECLOSESTHIGH</b> ([Ion Ratio]; [Area])	The ion ratio of the closest standard that has an area more than or equal to the area of the unknown sample. Refer to column 2 in the figure: <a href="#">Figure 2-5</a> .	<b>Standards</b>	<b>Error (N/A)</b>	No
Low Ref MRM Ratio	<b>GETSAMPLECLOSESTLOW</b> ([Ion Ratio]; [Area])	The ion ratio of the closest standard that has an area less than or equal to the area of the unknown sample. Refer to column 3 in the figure: <a href="#">Figure 2-5</a> .	<b>Standards</b>	<b>Error (N/A)</b>	No
Equal Ref MRM Ratio	<b>GETSAMPLEEQUAL</b> ([Ion Ratio]; [Area])	The result of <b>GETSAMPLEEQUAL</b> for standards only. Refer to column 4 in the figure: <a href="#">Figure 2-5</a> .	<b>Standards</b>	<b>Error (N/A)</b>	No

## Formulas

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### Compare the Area of Two Consecutive Samples: GETVALUE for Analysis of Recovery and Carryover

Table 2-5 Settings

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Previous SampleIndex	[Sample Index]-1	The index of the previous sample in the Results Table.	N/A	Error (N/A)	N/A
Previous SampleArea	<b>GETVALUE</b> ([Area]; [PreviousSampleIndex]; [Sample Index])	The areas of the components in the sample that was acquired before this one.	<b>Standards</b>	<b>Error (N/A)</b>	No

Figure 2-6 Results Table: PreviousSampleArea

Sample Type	Actual Concentration	Component Type	Area	*PreviousSampleArea	Sample Index	*PreviousSampleIndex
Unknown	N/A	Quantifiers	8.699e6	N/A	1	0.000
Solvent	N/A	Quantifiers	4.174e3	8.699e6	2	1.000
Solvent	N/A	Quantifiers	5.963e3	4.174e3	3	2.000
Solvent	N/A	Quantifiers	3.220e3	5.963e3	4	3.000
Solvent	N/A	Quantifiers	5.013e3	3.220e3	5	4.000
Blank	N/A	Quantifiers	1.694e6	5.013e3	6	5.000
Blank	N/A	Quantifiers	1.680e6	1.694e6	7	6.000
Blank	N/A	Quantifiers	1.706e6	1.680e6	8	7.000
Standard	0.000050	Quantifiers	1.498e6	1.706e6	9	8.000
Standard	0.000050	Quantifiers	1.488e6	1.498e6	10	9.000
Standard	0.000050	Quantifiers	1.476e6	1.488e6	11	10.000
Standard	0.000100	Quantifiers	1.627e6	1.476e6	12	11.000
Standard	0.000100	Quantifiers	1.569e6	1.627e6	13	12.000
Standard	0.000100	Quantifiers	1.727e6	1.569e6	14	13.000
Standard	0.000500	Quantifiers	2.186e6	1.727e6	15	14.000
Standard	0.000500	Quantifiers	2.333e6	2.186e6	16	15.000
Standard	0.000500	Quantifiers	2.077e6	2.333e6	17	16.000
Standard	0.001000	Quantifiers	2.833e6	2.077e6	18	17.000
Standard	0.001000	Quantifiers	3.514e6	2.833e6	19	18.000
Standard	0.001000	Quantifiers	2.659e6	3.514e6	20	19.000
Standard	0.002500	Quantifiers	4.150e6	2.659e6	21	20.000
Standard	0.002500	Quantifiers	4.256e6	4.150e6	22	21.000
Standard	0.002500	Quantifiers	4.333e6	4.256e6	23	22.000
Standard	0.005000	Quantifiers	7.957e6	4.333e6	24	23.000

## Formulas

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### Move Values from Two Transitions into One Row: GETGROUP

Table 2-6 Settings

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
GET Ametryn Group CalcConc	<b>GET</b> ([Calculated Concentration]; 'Ametryn 1')+ <b>GET</b> ([Calculated Concentration]; 'Ametryn 2')	The total calculated concentration for Ametryn 1 and Ametryn 2.	<b>Unknowns</b>	<b>Error (N/A)</b>	No
GETGROUP Qual CalcConc	<b>GETGROUP</b> ([Calculated Concentration];2)	The calculated concentration for the second transition in the group.	<b>Unknowns</b>	<b>Error (N/A)</b>	No

Figure 2-7 Results Table: GET Ametryn Group CalcConc and GETGROUP Qual CalcConc

Sample Type	Component Group Name	Component Name	Calculated Concentration	*GET Ametryn Group CalcConc	*GETGROUP Qual CalcConc	Component Type
Unknown	Ametryn	Ametryn 1	0.0070940	0.0138135	0.0067196	Quantifiers
Unknown	Ametryn	Ametryn 2	0.0067196	0.0138135	0.0067196	Qualifiers
Blank	Ametryn	Ametryn 1	0.0001011	N/A	< 0	Quantifiers
Blank	Ametryn	Ametryn 2	< 0	N/A	< 0	Qualifiers
Blank	Ametryn	Ametryn 1	0.0000261	N/A	< 0	Quantifiers
Blank	Ametryn	Ametryn 2	< 0	N/A	< 0	Qualifiers
Blank	Ametryn	Ametryn 1	0.0000620	0.0001700	0.0001081	Quantifiers
Blank	Ametryn	Ametryn 2	0.0001081	0.0001700	0.0001081	Qualifiers
Unknown	Ametryn	Ametryn 1	0.0746195	0.1501806	0.0755612	Quantifiers
Unknown	Ametryn	Ametryn 2	0.0755612	0.1501806	0.0755612	Qualifiers
Unknown	Ametryn	Ametryn 1	0.0782140	0.1561682	0.0779542	Quantifiers
Unknown	Ametryn	Ametryn 2	0.0779542	0.1561682	0.0779542	Qualifiers
Unknown	Ametryn	Ametryn 1	0.0752105	0.1515225	0.0763120	Quantifiers
Unknown	Ametryn	Ametryn 2	0.0763120	0.1515225	0.0763120	Qualifiers

## Make Statistics Values Available for Flagging and Reporting: GETSTAT

Table 2-7 Settings

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
CV%STD	<b>GETSTAT</b> ('Percent CV'; 'Calculated Concentration')	The <b>Percent CV</b> value for the <b>Calculated Concentration</b> from the Statistics table for standards and QCs.	N/A	<b>Error (N/A)</b>	N/A

## Formulas

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**Table 2-7 Settings (continued)**

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Av_RT_Prefix	<b>GETSTAT</b> ('MEAN'; 'Retention Time'; 'Sample Name Prefix')	The mean value for <b>Retention Time</b> for samples grouped by <b>Sample Name prefix</b> .	<b>Standards</b>	<b>Error (N/A)</b>	No

Figure 2-8 Results Table: CV%STD

Index	Sample Name	Sample Type	Actual Concentration	*CV%STD	*Av_RT_Prefix	Component Type	Area	Retention Time Delta...	Retention Time	Expec... RT	Calculated Concentration	Accuracy	Precursor Mass
12...	0.25 ng/mg hair extr_3	Standard	0.250000	0.26	4.21	Quantifiers	1.596e8	0.02	4.20	4.22	0.2917783	116.71	290.200
12...	0.5 ng/mg hair extr_1	Standard	0.500000	1.29	4.21	Quantifiers	2.989e8	0.01	4.21	4.22	0.5319017	106.38	290.200
13...	0.5 ng/mg hair extr_2	Standard	0.500000	1.29	4.21	Quantifiers	2.934e8	0.01	4.21	4.22	0.5263914	105.28	290.200
13...	0.5 ng/mg hair extr_3	Standard	0.500000	1.29	4.21	Quantifiers	2.770e8	0.00	4.22	4.22	0.5183921	103.68	290.200
13...	0.75 ng/mg hair extr_1	Standard	0.750000	1.98	4.21	Quantifiers	4.096e8	0.02	4.20	4.22	0.7080770	94.41	290.200
13...	0.75 ng/mg hair extr_2	Standard	0.750000	1.98	4.21	Quantifiers	4.260e8	0.01	4.21	4.22	0.7174477	95.66	290.200
14...	0.75 ng/mg hair extr_3	Standard	0.750000	1.98	4.21	Quantifiers	4.120e8	0.01	4.21	4.22	0.7360602	98.14	290.200
14...	1.0 ng/mg hair extr_1	Standard	1.000000	3.62	4.21	Quantifiers	5.032e8	0.01	4.20	4.22	0.8636387	86.36	290.200
14...	1.0 ng/mg hair extr_2	Standard	1.000000	3.62	4.21	Quantifiers	4.846e8	0.00	4.21	4.22	0.8438771	84.39	290.200
14...	1.0 ng/mg hair extr_3	Standard	1.000000	3.62	4.21	Quantifiers	5.026e8	0.02	4.20	4.22	0.9055541	90.56	290.200

Row	Com...	Actual Concentr...	Num. Values	Mean	Standard Devi...	Percent CV	Average Accuracy across Re...	Value #1	Value #2	Value #3
7	Noec...	0.007500	3 of 3	0.0086871	0.0003241	3.73	115.83	0.0083630	0.0086871	0.0090111
8	Noec...	0.010000	3 of 3	0.0113456	0.0004335	3.82	113.46	0.0108480	0.0116410	0.0115479
9	Noec...	0.025000	3 of 3	0.0289848	0.0014867	5.13	115.94	0.0272738	0.0299608	0.0297200
10	Noec...	0.050000	3 of 3	0.0581842	0.0014612	2.51	116.37	0.0592287	0.0565145	0.0588095
11	Noec...	0.075000	1 of 1	0.1184153	N/A	N/A	157.89	0.1184153		
12	Noec...	0.100000	3 of 3	0.1734780	0.0897117	51.71	173.48	0.1236648	0.1197261	0.2770432
13	Noec...	0.250000	2 of 2	0.2923103	0.0007523	0.26	116.92	0.2928423	0.2917783	
14	Noec...	0.500000	3 of 3	0.5255618	0.0067929	1.29	105.11	0.5319017	0.5263914	0.5183921
15	Noec...	0.750000	3 of 3	0.7205283	0.0142437	1.98	96.07	0.7080770	0.7174477	0.7360602
16	Noec...	1.000000	3 of 3	0.8710233	0.0314946	3.62	87.10	0.8636387	0.8438771	0.9055541

## Formulas

Figure 2-9 Results Table: Av\_RT\_Prefix

Index	Sample Name	Sample Type	Actual Concentration	*CV%STD	*Av_RT_Prefix	Component Type	Area	Retention Time Delta...	Retention Time	Expec... RT	Calculated Concentration	Accuracy	Precursor Mass
846	0.01 ng/mg hair extr_3	Standard	0.010000	2.57	4.10	Quantifiers	1.248e7	0.01	4.10	4.10	0.0100916	100.92	304.200
873	0.025 ng/mg hair extr_1	Standard	0.025000	2.51	4.10	Quantifiers	2.638e7	0.01	4.10	4.10	0.0249202	99.68	304.200
900	0.025 ng/mg hair extr_2	Standard	0.025000	2.51	4.10	Quantifiers	2.952e7	0.01	4.09	4.10	0.0260588	104.24	304.200
927	0.025 ng/mg hair extr_3	Standard	0.025000	2.51	4.10	Quantifiers	2.812e7	0.00	4.10	4.10	0.0260162	104.06	304.200
954	0.05 ng/mg hair extr_1	Standard	0.050000	3.20	4.09	Quantifiers	5.626e7	0.02	4.09	4.10	0.0493750	98.75	304.200
981	0.05 ng/mg hair extr_2	Standard	0.050000	3.20	4.09	Quantifiers	5.180e7	0.00	4.10	4.10	0.0473298	94.66	304.200
10...	0.05 ng/mg hair extr_3	Standard	0.050000	3.20	4.09	Quantifiers	5.619e7	0.02	4.08	4.10	0.0504120	100.82	304.200
10...	UnknownCX_1	Unknown	N/A	N/A	4.09	Quantifiers	7.659e7	0.00	4.10	4.10	0.0746195	N/A	304.200
10...	UnknownCX_1	Unknown	N/A	N/A	4.09	Quantifiers	8.119e7	0.01	4.09	4.10	0.0782140	N/A	304.200
10...	UnknownCX_1	Unknown	N/A	N/A	4.09	Quantifiers	8.461e7	0.02	4.09	4.10	0.0752105	N/A	304.200

Row	Com...	Sample Name	Num. Values	Mean	Standard Devi...	Percent CV	Value #1	Value #2	Value #3	Value #4	Value #5	Value #6	Value #7
10	Coca...	0.05 ng/mg hair extr	3 of 3	4.09	0.01	0.20	4.09	4.10	4.08				
11	Coca...	0.1 ng/mg hair extr	0 of 3	N/A	N/A	N/A	4.10	4.08	4.10				
12	Coca...	0.25 ng/mg hair extr	0 of 3	N/A	N/A	N/A	4.08	4.10	4.08				
13	Coca...	0.5 ng/mg hair extr	0 of 3	N/A	N/A	N/A	4.09	4.09	4.10				
14	Coca...	0.75 ng/mg hair extr	0 of 3	N/A	N/A	N/A	4.08	4.09	4.09				
15	Coca...	1.0 ng/mg hair extr	0 of 3	N/A	N/A	N/A	4.08	4.09	4.08				
16	Coca...	Blank hair extr	3 of 3	4.10	0.01	0.13	4.09	4.10	4.10				
17	Coca...	Postspike hair extr 0.5 ng...	1 of 1	4.11	N/A	N/A	4.11						
18	Coca...	UnknownCX	3 of 3	4.09	0.01	0.18	4.10	4.09	4.09				
19	Coca...	Warmup - MeOH Blank	7 of 7	3.84	0.15	3.97	3.91	3.64	3.82	3.96	3.76	3.72	4.08



## Aggregate Functions

Aggregate functions are functions that operate on multiple rows. For example, the **MIN** function finds the lowest value for a column in all of the rows of the Results Table. The **MEAN** function calculates the average value for a column.

**Table 2-8 Settings**

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
STD COUNT Area	<b>COUNT</b> ([Area])	The number of values for area found for standard samples	<b>Standards</b>	<b>Ignore</b>	No
STD MAX Area	<b>MAX</b> ([Area])	The largest value found for area for standard samples	<b>Standards</b>	<b>Ignore</b>	No
STD MEAN Area	<b>MEAN</b> ([Area])	The average value for area for standard samples	<b>Standards</b>	<b>Ignore</b>	No
STD MEDIAN Area	<b>MEDIAN</b> ([Area])	The median area value for standard samples	<b>Standards</b>	<b>Ignore</b>	No
STD MIN Area	<b>MIN</b> ([Area])	The minimum area value for standard samples	<b>Standards</b>	<b>Ignore</b>	No
STD STDEV Area	<b>STDEV</b> ([Area])	The standard deviation of the area value for standard samples	<b>Standards</b>	<b>Ignore</b>	No
STD SUM Area	<b>SUM</b> ([Area])	The total value of all area values for standard samples	<b>Standards</b>	<b>Ignore</b>	No

## Formulas

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**Figure 2-10 Results Table: Aggregate Functions**

Index	Sample Name ▾	Sample Type ▾	Component Name ▾	Area ▾	Used ▾	*STD MIN Area ▾	*STD MAX Area ▾	*STD MEAN Area ▾	*STD SUM Areas ▾	*STD MEDIAN Area ▾	*STD STDEV Area ▾	*STD COUNT Area ▾
45	STD 0.01	Standard	Ametryn 1	74381.256	<input checked="" type="checkbox"/>	74351.280	81066809.991	14078224.550	98547571.847	783230.401	29749063.663	7.000
56	STD 0.01	Standard	Ametryn 1	74351.280	<input checked="" type="checkbox"/>	74351.280	81066809.991	14078224.550	98547571.847	783230.401	29749063.663	7.000
67	STD 0.1	Standard	Ametryn 1	783230.401	<input checked="" type="checkbox"/>	74351.280	81066809.991	14078224.550	98547571.847	783230.401	29749063.663	7.000
78	STD 0.1	Standard	Ametryn 1	778397.852	<input checked="" type="checkbox"/>	74351.280	81066809.991	14078224.550	98547571.847	783230.401	29749063.663	7.000
89	STD 1	Standard	Ametryn 1	7933715.370	<input checked="" type="checkbox"/>	74351.280	81066809.991	14078224.550	98547571.847	783230.401	29749063.663	7.000
100	STD 1	Standard	Ametryn 1	7836685.698	<input checked="" type="checkbox"/>	74351.280	81066809.991	14078224.550	98547571.847	783230.401	29749063.663	7.000
111	STD 10	Standard	Ametryn 1	81066809.991	<input checked="" type="checkbox"/>	74351.280	81066809.991	14078224.550	98547571.847	783230.401	29749063.663	7.000
▶ 122	STD 10	Standard	Ametryn 1	79964706.071	<input type="checkbox"/>	74351.280	81066809.991	14078224.550	98547571.847	783230.401	29749063.663	7.000

## Numeric Functions

Table 2-9 Settings

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Rounded Calc. Conc	ROUND([Calculated Concentration];3)	<b>Calculated Concentration</b> rounded to 3 decimal places.	N/A	<b>Error (N/A)</b>	N/A
Calc. Conc Ceiling	CEILING([Calculated Concentration])	The smallest integer more than (or equal to) the <b>Calculated Concentration</b> .	N/A	<b>Error (N/A)</b>	N/A
Calc. Conc Floor	FLOOR([Calculated Concentration])	The largest integer less than (or equal to) the <b>Calculated Concentration</b> .	N/A	<b>Error (N/A)</b>	N/A

## Formulas

Figure 2-11 Results Table: Numeric Functions

Index	Sample Na...	Sample Type	Component Name	Component Type	Component Group Name	Area	Actual Concentration	Calculated Concentration	*Rounded Calc. Conc.	*Ceiling	*Floor
1	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	9.172e1	N/A	< 0	N/A	N/A	N/A
7	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	6.818e2	N/A	< 0	N/A	N/A	N/A
13	STD_01	Standard	vitd3 1	Quantifiers	vitd3	9.501e3	4.50	1.62324	1.623	2.0	1
19	STD_02	Standard	vitd3 1	Quantifiers	vitd3	5.679e4	18.76	25.07507	25.075	26.0	25
25	STD_03	Standard	vitd3 1	Quantifiers	vitd3	1.128e5	37.50	52.83989	52.840	53.0	52
31	STD_04	Standard	vitd3 1	Quantifiers	vitd3	1.709e5	75.00	81.65117	81.651	82.0	81
37	STD_05	Standard	vitd3 1	Quantifiers	vitd3	2.099e5	112.50	100.99784	100.998	101.0	100
43	STD_06	Standard	vitd3 1	Quantifiers	vitd3	2.806e5	150.00	136.07280	136.073	137.0	136
49	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	6.084e2	N/A	< 0	N/A	N/A	N/A
55	QC_Low_6040	Quality Control	vitd3 1	Quantifiers	vitd3	2.162e4	8.00	7.63356	7.634	8.0	7
61	QC_L1_6041	Quality Control	vitd3 1	Quantifiers	vitd3	4.458e4	20.00	19.01736	19.017	20.0	19
67	QC_L2_6042	Quality Control	vitd3 1	Quantifiers	vitd3	1.282e5	60.00	60.48824	60.488	61.0	60
73	LO Pool	Unknown	vitd3 1	Quantifiers	vitd3	1.363e4	N/A	3.67084	3.671	4.0	3
79	LO Pool	Unknown	vitd3 1	Quantifiers	vitd3	1.354e4	N/A	3.62390	3.624	4.0	3
85	LO Pool							3.79319	3.793	4.0	3
91	MID LO Po							31.20914	31.209	32.0	31
97	MID LO Po							40.31222	40.312	41.0	40
103	MID LO Po							40.44256	40.443	41.0	40
109	MID Pool							67.19331	67.193	68.0	67
115	MID Pool							72.37389	72.374	73.0	72
121	MID Pool							74.28161	74.282	75.0	74
127	MID HI Po							92.50405	92.504	93.0	92
133	MID HI Po							102.30208	102.302	103.0	102
139	MID HI Po							104.47659	104.477	105.0	104

**Results Table Display Settings**

Project: BIQ3  
Show and hide specific columns in the results table

Column Groups:  
Custom Column Import... Export...

Column Name	Visible	Number Format	Number Format Precision	LIS Supported
Ceiling	<input checked="" type="checkbox"/>	Decimal	0.0	<input type="checkbox"/>
Floor	<input checked="" type="checkbox"/>	Decimal	0	<input type="checkbox"/>
Rounded Calc. Conc.	<input checked="" type="checkbox"/>	Decimal	0.000	<input type="checkbox"/>

Column display settings are saved as a part of a layout OK Cancel

**Note:** In this example, the **ROUND** function uses three decimal places, as shown in the formula: **ROUND ( [ Calculated Concentration ] ; 3 )**. The **CEILING** function gets the smallest integer that is more than or equal to the **Calculated Concentration**. The value is configured as one decimal place in the Results Table Display Settings dialog. The **FLOOR** function gets the largest integer that is less than or equal to the **Calculated Concentration**. The value is configured as zero decimal places in the Results Table Display Settings dialog.

## Number Format

Table 2-10 Settings

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Calc. Conc. Format	IF([Calculated Concentration]<1;TEXT([Calculated Concentration];'#0.00');IF([Calculated Concentration]<10;TEXT([Calculated Concentration];'#0.0');TEXT([Calculated Concentration];'#,###'))	<b>Calculated Concentration</b> formatted as applicable to the limits for the result.	N/A	<b>Error (N/A)</b>	N/A

## Text Functions

Use Calculated Concentration to Identify Peaks for Which Review is Required: ISNUMBER

Table 2-11 Settings

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Calc. Conc. Review	<b>ISNUMBER</b> ([Calculated Concentration])	<i>true</i> if <b>Calculated Concentration</b> contains a number, or <i>false</i> if it does not.	N/A	<b>Error (N/A)</b>	N/A
Review Peak	<b>ISNUMBER</b> ([Calc. Conc. Review]= true; [Area]; 'Review Needed')	If the calculated concentration is a number, then the area. If the calculated concentration is text, then "Review Needed".	N/A	<b>Error (N/A)</b>	N/A

Figure 2-12 Results Table: Calc. Conc. Review and Review Peak

Index	Sample Na...	Sample Type	Component Name	Component Type	Component Group Name	Area	Actual Concentration	Calculated Concentration	*Calc. Conc. Review	*Review Peak	Exp... RT	Ret... Time	Ret... Tim...	Ion Ratio
1	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	9.172e1	N/A	< 0	false	Review Needed	0.21	0.22	0.01	0.782
7	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	6.818e2	N/A	< 0	false	Review Needed	0.21	0.20	0.01	0.536
13	STD_01	Standard	vitd3 1	Quantifiers	vitd3	9.501e3	4.50	1.623e0	true	9.501e3	0.21	0.21	0.00	1.177
19	STD_02	Standard	vitd3 1	Quantifiers	vitd3	5.679e4	18.76	2.508e1	true	5.679e4	0.21	0.21	0.00	1.128
25	STD_03	Standard	vitd3 1	Quantifiers	vitd3	1.128e5	37.50	5.284e1	true	1.128e5	0.21	0.21	0.00	1.217
31	STD_04	Standard	vitd3 1	Quantifiers	vitd3	1.709e5	75.00	8.165e1	true	1.709e5	0.21	0.21	0.00	1.130
37	STD_05	Standard	vitd3 1	Quantifiers	vitd3	2.099e5	112.50	1.010e2	true	2.099e5	0.21	0.21	0.00	1.153
43	STD_06	Standard	vitd3 1	Quantifiers	vitd3	2.806e5	150.00	1.361e2	true	2.806e5	0.21	0.21	0.00	1.196
49	BLANK	Unknown	vitd3 1	Quantifiers	vitd3	6.084e2	N/A	< 0	false	Review Needed	0.20	0.20	0.00	0.858
55	QC_Low_6040	Quality Control	vitd3 1	Quantifiers	vitd3	2.162e4	8.00	7.634e0	true	2.162e4	0.21	0.21	0.00	1.119
61	QC_L1_6041	Quality Control	vitd3 1	Quantifiers	vitd3	4.458e4	20.00	1.902e1	true	4.458e4	0.21	0.20	0.00	1.177
67	QC_L2_6042	Quality Control	vitd3 1	Quantifiers	vitd3	1.282e5	60.00	6.049e1	true	1.282e5	0.21	0.20	0.00	1.126
73	LO Pool	Unknown	vitd3 1	Quantifiers	vitd3	N/A	N/A	N/A	false	Review Needed	0.21	N/A	N/A	N/A
79	LO Pool	Unknown	vitd3 1	Quantifiers	vitd3	1.354e4	N/A	3.624e0	true	1.354e4	0.21	0.20	0.00	1.174
85	LO Pool	Unknown	vitd3 1	Quantifiers	vitd3	1.388e4	N/A	3.793e0	true	1.388e4	0.21	0.20	0.00	1.242
91	MID LO Pool	Unknown	vitd3 1	Quantifiers	vitd3	6.916e4	N/A	3.121e1	true	6.916e4	0.21	0.20	0.01	1.153
97	MID LO Pool	Unknown	vitd3 1	Quantifiers	vitd3	8.752e4	N/A	4.031e1	true	8.752e4	0.21	0.20	0.00	1.126
103	MID LO Pool	Unknown	vitd3 1	Quantifiers	vitd3	8.778e4	N/A	4.044e1	true	8.778e4	0.21	0.20	0.01	1.138
109	MID Pool	Unknown	vitd3 1	Quantifiers	vitd3	1.417e5	N/A	6.719e1	true	1.417e5	0.21	0.21	0.00	1.158
115	MID Pool	Unknown	vitd3 1	Quantifiers	vitd3	1.522e5	N/A	7.237e1	true	1.522e5	0.21	0.20	0.00	1.132
121	MID Pool	Unknown	vitd3 1	Quantifiers	vitd3	1.560e5	N/A	7.428e1	true	1.560e5	0.21	0.20	0.01	1.116
127	MID HI Pool	Unknown	vitd3 1	Quantifiers	vitd3	1.928e5	N/A	9.250e1	true	1.928e5	0.21	0.20	0.00	1.170
133	MID HI Pool	Unknown	vitd3 1	Quantifiers	vitd3	2.125e5	N/A	1.023e2	true	2.125e5	0.21	0.20	0.01	1.165
139	MID HI Pool	Unknown	vitd3 1	Quantifiers	vitd3	2.169e5	N/A	1.045e2	true	2.169e5	0.21	0.20	0.00	1.177

## Formulas

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### Extract Information from the Sample ID and Barcode Columns: LEFT, TRIM and RIGHT

Table 2-12 Settings

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Assay	<b>LEFT</b> ([Sample ID];4)	The first four characters (letters or numbers) of <b>Sample ID</b> .	N/A	<b>Error (N/A)</b>	N/A
Barcode Trim	<b>TRIM</b> ([Barcode])	The contents of the <b>Barcode</b> column with all spaces removed.	N/A	<b>Error (N/A)</b>	N/A
Req #	<b>RIGHT</b> ([Barcode Trim];8)	Last 8 characters from Barcode Trim.	N/A	<b>Error (N/A)</b>	N/A



Figure 2-13 Results Table: Calculated Columns with LEFT, TRIM, and RIGHT Functions

Sample Type	Component Type	Sample ID	*Assay	Barcode	*Barcode Trim	*Req #
Unknown	Quantifiers	ABCD-EE_Alprazolam 1	ABCD	AB 01234 PX	AB 01234 PX	01234 PX
Unknown	Quantifiers	ABCD-EE_Amphetamine 1	ABCD	AB 98020 PX	AB 98020 PX	98020 PX
Unknown	Quantifiers	ABCD-EE_Benzoylecgonine 1	ABCD	AB 09432 PX	AB 09432 PX	09432 PX
Unknown	Quantifiers	ABCD-EE_Benzotropine 1	ABCD	OB 01234 DN	OB 01234 DN	01234 DN
Unknown	Quantifiers	ABCD-EE_Bromazepam 1	ABCD	BN 01234 HD	BN 01234 HD	01234 HD
Unknown	Quantifiers	ABCD-EE_Buprenorphine 1	ABCD	AB 000834 PX	AB 000834 PX	00834 PX
Unknown	Quantifiers	ABCD-EE_Cannabidiol 1	ABCD	OB 65849 DN	OB 65849 DN	65849 DN
Unknown	Quantifiers	ABCD-EE_Cannabigerol 1	ABCD	AB 23854 PX	AB 23854 PX	23854 PX
Unknown	Quantifiers	ABCD-EE_Cannabinol 1	ABCD	AB 01783 PX	AB 01783 PX	01783 PX
Unknown	Quantifiers	ABCD-EE_Carboxy THC 1	ABCD	BN 30004 HD	BN 30004 HD	30004 HD
Unknown	Quantifiers	ABCD-EE_Carisoprodol 1	ABCD	AB 01234 PX	AB 01234 PX	01234 PX

Item	Description
1	The first four characters from the <b>Sample ID</b> column.
2	All leading, trailing, and internal spaces, except for the single spaces between strings, removed from the <b>Barcode</b> column.
3	The last eight characters from the <code>Barcode Trim</code> column.

## Formulas

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**Note:** The **LEFT** and **RIGHT** functions are not recommended for use with numeric columns. The **Number Format Precision** of the numeric values that are applied in the Results Table Display Settings dialog is not included in the calculation. These functions operate on the full underlying value.

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## Text Format

**Table 2-13 Settings**

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Date Format 1	TEXT([Acquisition Date & Time]; 'yyyy-MMMM-dd')	2022-May-04	N/A	Error (N/A)	N/A
Date Format 2	TEXT([Acquisition Date & Time]; 'MM/dd/yyyy')	05/04/2022	N/A	Error (N/A)	N/A
Date Format 3	TEXT([Acquisition Date & Time]; 'dddd MMM dd, yyyy')	Wednesday May 04, 2022	N/A	Error (N/A)	N/A

## IF Function

### Use Mean Area for Internal Standards to Do a Test of Internal Standard Performance

The mean value of the internal standard (IS) area is calculated across the applicable samples and compared to a value of 1e6. If **MEAN ([IS Area])** is greater than 1e6, that is, the *condition* is true, then the mean IS area value is shown in the related Results Table column. If **MEAN ([IS Area])** is less than 1e6, that is, the *condition* is false, then **Review IS performance** is shown.

**Table 2-14 Settings**

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
IS Performance	<b>IF (MEAN ([IS Area]) &gt;=1e6; MEAN ([IS Area]); 'Review IS performance')</b>	If true, the mean IS area, if false, the text . <b>Review IS performance</b> .	N/A	<b>Error (N/A)</b>	N/A

## Formulas

**Make Sure That the Retention Time of the Analyte in the Unknown Sample is the Same as That of the Calibration Standard, with a Tolerance of  $\pm 0.1$  Minutes**

**Table 2-15 Settings**

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
RT_Check	<b>IF</b> ([Sample Type]='Unknown'; <b>IF</b> ( <b>ABS</b> ( <b>MEAN</b> ([Retention Time]- [Retention Time])<=0.1; 'RT Pass'; 'RT Fail')); 'N/A')	If the difference between the retention time for the sample and the retention time for the standard is more than 0.1, then RT Fail. If it is less, then RT Pass. If the sample is not an unknown, then N/A.	<b>Standards</b>	<b>Error (N/A)</b>	No
STD Mean RT	<b>MEAN</b> ([Retention Time])	The average retention time for all standard samples.	<b>Standards</b>	<b>Ignore</b>	No
RT delta	<b>ABS</b> ([STD Mean RT]- [Retention Time])	The absolute value of the difference between the mean retention time and the retention time for the sample.	<b>All</b>	<b>Error (N/A)</b>	No
Check RT delta	<b>IF</b> ([RT delta]>0.1; 'RT Fail'; 'RT Pass')	If the difference between the retention time for the sample and the retention time of the unknown is more than 0.1, then RT Fail. If it is less, then RT Pass.	N/A	<b>Error (N/A)</b>	No

Table 2-15 Settings (continued)

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
Check RT Unknowns	<b>IF</b> ([Sample Type]='Unknown'; [Check RT delta]; 'N/A')	The unknown samples in the output from Check RT delta.	N/A	<b>Error (N/A)</b>	No

## Formulas

**Figure 2-14 Results Table: STD Mean RT, RT delta, Check RT Unknown**

Index	Sample Na...	Sample Type	Component Name	Retention Time	Used	*Unknown RT Check	*STD Mean RT	*RT delta	*Check RT delta	*Check RT Unknown
1	Solvent	Solvent	Ametryn 1	N/A	<input checked="" type="checkbox"/>	N/A	2.192	N/A	RT Pass	N/A
12	Solvent	Solvent	Ametryn 1	N/A	<input checked="" type="checkbox"/>	N/A	2.192	N/A	RT Pass	N/A
23	Double Blank	Double Blank	Ametryn 1	2.75	<input checked="" type="checkbox"/>	N/A	2.192	0.557	RT Fail	N/A
34	Blank	Blank	Ametryn 1	2.26	<input checked="" type="checkbox"/>	N/A	2.192	0.070	RT Pass	N/A
45	STD 0.01	Standard	Ametryn 1	2.20	<input checked="" type="checkbox"/>	N/A	2.192	0.004	RT Pass	N/A
56	STD 0.01	Standard	Ametryn 1	2.19	<input checked="" type="checkbox"/>	N/A	2.192	0.003	RT Pass	N/A
67	STD 0.1	Standard	Ametryn 1	2.18	<input checked="" type="checkbox"/>	N/A	2.192	0.008	RT Pass	N/A
78	STD 0.1	Standard	Ametryn 1	2.19	<input checked="" type="checkbox"/>	N/A	2.192	0.004	RT Pass	N/A
89	STD 1	Standard	Ametryn 1	2.18	<input checked="" type="checkbox"/>	N/A	2.192	0.009	RT Pass	N/A
100	STD 1	Standard	Ametryn 1	2.20	<input checked="" type="checkbox"/>	N/A	2.192	0.013	RT Pass	N/A
111	STD 10	Standard	Ametryn 1	2.20	<input checked="" type="checkbox"/>	N/A	2.192	0.007	RT Pass	N/A
122	STD 10	Standard	Ametryn 1	2.19	<input checked="" type="checkbox"/>	N/A	2.192	0.001	RT Pass	N/A
133	Double Blank	Double Blank	Ametryn 1	N/A	<input checked="" type="checkbox"/>	N/A	2.192	N/A	RT Pass	N/A
144	Low QC	Quality Control	Ametryn 1	2.19	<input checked="" type="checkbox"/>	N/A	2.192	0.001	RT Pass	N/A
155	Medium QC	Quality Control	Ametryn 1	2.20	<input checked="" type="checkbox"/>	N/A	2.192	0.013	RT Pass	N/A
166	High QC	Quality Control	Ametryn 1	2.20	<input checked="" type="checkbox"/>	N/A	2.192	0.004	RT Pass	N/A
177	Blank	Blank	Ametryn 1	N/A	<input checked="" type="checkbox"/>	N/A	2.192	N/A	RT Pass	N/A
188	Unknown 1	Unknown	Ametryn 1	2.19	<input checked="" type="checkbox"/>	RT Pass	2.192	0.003	RT Pass	RT Pass
199	Unknown 1	Unknown	Ametryn 1	2.18	<input checked="" type="checkbox"/>	RT Pass	2.192	0.010	RT Pass	RT Pass
210	Unknown 2	Unknown	Ametryn 1	2.20	<input checked="" type="checkbox"/>	RT Pass	2.192	0.006	RT Pass	RT Pass
221	Unknown 2	Unknown	Ametryn 1	2.20	<input checked="" type="checkbox"/>	RT Pass	2.192	0.005	RT Pass	RT Pass

### Use the Ion Ratio Confidence Traffic Lights to Identify Peaks that Require Revision

The **IF** function can be used to do a test of columns that contain traffic lights. Traffic lights can have the following values: *Red*, *Yellow*, *Green*, and *Grey*.

Table 2-16 Settings

Name	Formula	Output	Sample Types	Treat resulting text values as	Include Unused Samples
MRM Ratio Fails	<code>IF([Ion Ratio Confidence]='Red'    [Ion Ratio Confidence]='Yellow'    [Ion Ratio Confidence]='Grey'; 'NeedsRevision'; 'Pass')</code>	If <b>Ion Ratio Confidence</b> is red, yellow, or grey, then Needs Revision. If it is not, then Pass.	N/A	Error (N/A)	N/A

Figure 2-15 Results Table: MRM Ratio Fails

Ion Ra...	*MRM Ratio Fails ▾	Ion Ratio ▾
●	NeedsRevision	N/A
●	NeedsRevision	0.6654
✓	Pass	1.2094
✓	Pass	1.1556
✓	Pass	1.2207
✓	Pass	1.1515
✓	Pass	1.1595
✓	Pass	1.2052
▲	NeedsRevision	0.7779

# Conditional Lookup

---

# 3

A conditional lookup column contains a value that is controlled by the value of another column, as specified in a conditional lookup table entry.

Entries in the conditional lookup table contain this information:

- A standard or custom Results Table column
- A condition, such as **Equals**
- A lookup value
- The output value to be shown in the conditional lookup column in the Results Table

If the lookup column uses multiple conditions, then the conditions are used with the Boolean AND (not OR) operator. If the combination of conditions is false, that is, it has no results, then the value in the **Default output** field is used.

During processing, a Results Table column is created for each conditional lookup. If at least one result in the column is numeric, then the column is a numeric column, and a number format can be selected for the column. If none of the results in the lookup column are numeric, then the column is a text column.

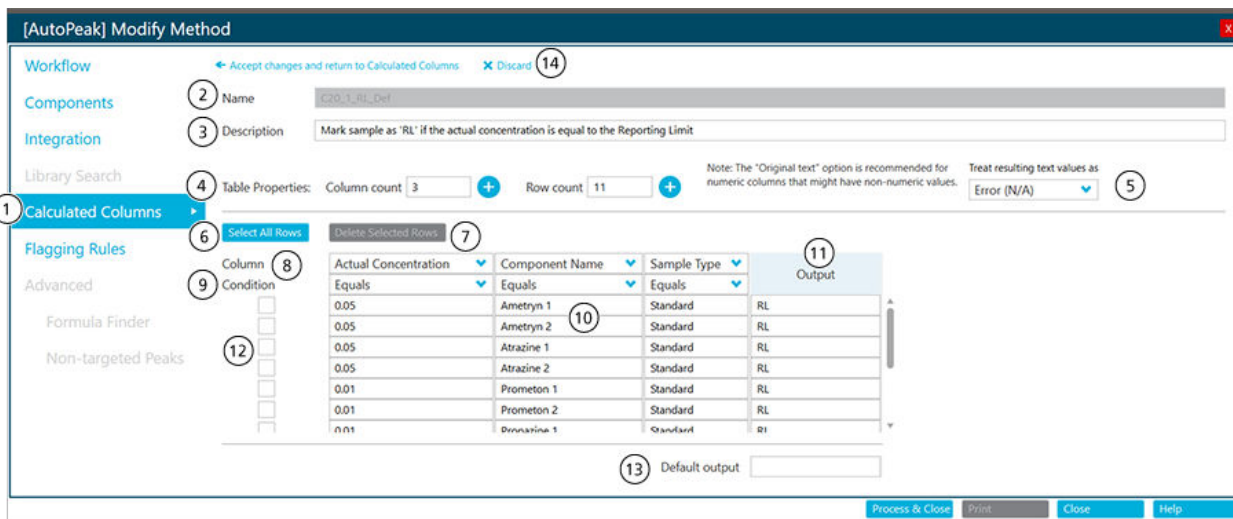
Flagging can be used for Results Table columns created with conditional lookup. These columns can also be used in formulas.


## Conditional Lookup Editor

The following image shows the interface for the conditional lookup editor.



Figure 3-1 Conditional Lookup Editor



Item	Description
1	The <b>Calculated Columns</b> step in the workflow of the processing method. Click to open the Calculated Columns page, and then click <b>Add &gt; Conditional lookup</b> .
2	The <b>Name</b> field. Type a name for the formula.  <b>Tip!</b> The conditional lookup is added as a column in the Results Table after processing. The column header is the name of the conditional lookup. For best use of screen space, we recommend that names be kept short. Detailed information can be included in the <b>Description</b> field.
3	The <b>Description</b> field. The description is shown on the Calculated Columns page.
4	The number of rows and columns in the table. To change the number of columns or rows, type a number in the <b>Column count</b> or <b>Row count</b> field.  Or, click the applicable  to add a column or row.
5	A set of options that control what is done with text entries. The <b>Treat resulting text values as</b> field is important in Results Table columns that might contain both numeric and text outputs, such as N/A and the symbols for degenerate and infinity. For more information, refer to the section: <a href="#">The Treat resulting text values as Option</a>
6	Click to select all of the rows.

## Conditional Lookup

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Item	Description
7	Click to delete the selected rows.
8	<p>The columns to be used in the conditional lookup. Custom text columns, calculated columns, and conditional lookup columns can be used.</p> <hr/> <p><b>Note:</b> This field has a right-click menu that can be used to add, delete, copy, and paste columns.</p> <hr/>
9	<p>The condition to be used in the conditional lookup table. Available conditions include the following:</p> <ul style="list-style-type: none"><li>• <b>Equals</b></li><li>• <b>Not equal</b></li><li>• <b>Starts with</b></li><li>• <b>Contains</b></li><li>• <b>Less than</b></li><li>• <b>Less than or equal</b></li><li>• <b>Greater than</b></li><li>• <b>Greater than or equal</b></li></ul>
10	<p>The value to be used in the condition statement. The value must be correct for the type of Results Table column. The value can be numeric, Boolean (<b>true</b> or <b>false</b>), or text.</p> <hr/> <p><b>Note:</b> This field has a right-click menu that can be used to add, delete, copy, and paste columns and rows.</p> <hr/>
11	<p>The value or text to be shown in the conditional lookup column when all of the conditions are met.</p> <hr/> <p><b>Note:</b> This field has a right-click menu that can be used to add, delete, copy, and paste columns and rows.</p> <hr/>
12	Select the check box to select a row for deletion.

Item	Description
13	<p>The value or text to be shown in the conditional lookup column when none of the conditions are met.</p> <hr/> <p><b>Note:</b> This field has a right-click menu that can be used to cut, copy, and paste content in this field.</p> <hr/>
14	Options to save or discard the conditional lookup.

# Examples: Conditional Lookup

Example: Lower and Upper Reportable Limit Controlled by Analyte (Compound Name) and Sample Matrix Type (Sample ID)

Figure 3-2 Conditional Lookup Table: Output Value Set to a Lower Reportable Limit Related to the Analyte and Sample Matrix Type

Workflow    ← Accept changes and return to Calculated Columns    ✕ Discard

Components    Name: LRL

Integration    Description: Indicate the lower reportable limit depending on the matrix type and analyte

Library Search

Calculated Columns    Table Properties: Column count: 2    Row count: 45    Note: The "Original text" option is recommended for numeric columns that might have non-numeric values.    Treat resulting text values as: Original text

Flagging Rules    Select All Rows    Delete Selected Rows

Column	Component Name	Sample ID	Output
Condition	Equals	Equals	
<input type="checkbox"/>	BZE 1	Urine	0.01
<input type="checkbox"/>	BZE 1	Serum	0.025
<input type="checkbox"/>	BZE 1	Oral Fluid	0.01
<input type="checkbox"/>	BZE 1	Hair	0.025
<input type="checkbox"/>	Cocaethylene 1	Urine	0.001
<input type="checkbox"/>	Cocaethylene 1	Serum	0.0025
<input type="checkbox"/>	Cocaethylene 1	Oral Fluid	0.001
<input type="checkbox"/>	Cocaethylene 1	Hair	0.0025
<input type="checkbox"/>	Cocaine 1	Urine	0.001
<input type="checkbox"/>	Cocaine 1	Serum	0.001
<input type="checkbox"/>	Cocaine 1	Oral Fluid	0.001
<input type="checkbox"/>	Cocaine 1	Hair	0.001
<input type="checkbox"/>	m-OH-BZE 1	Urine	0.01
<input type="checkbox"/>	m-OH-BZE 1	Serum	0.05
<input type="checkbox"/>	m-OH-BZE 1	Oral Fluid	0.025
<input type="checkbox"/>	m-OH-BZE 1	Hair	0.05

Default output:

Process & Close    Print    Close    Help

**Figure 3-3 Conditional Lookup Table: Output Value Set to an Upper Reportable Limit Related to the Analyte and Sample Matrix Type**

**Workflow**

Components

Integration

Library Search

**Calculated Columns**

Flagging Rules

Advanced

Formula Finder

Non-targeted Peaks

← Accept changes and return to Calculated Columns
✕ Discard

Name:

Description:

Table Properties: Column count  + Row count  +

Note: The "Original text" option is recommended for numeric columns that might have non-numeric values. Treat resulting text values as

Select All Rows
Delete Selected Rows

Column	Component Name	Sample ID	Output
<input type="checkbox"/>	Equals	Equals	
<input type="checkbox"/>	BZE 1	Urine	1000
<input type="checkbox"/>	BZE 1	Serum	100
<input type="checkbox"/>	BZE 1	Oral Fluid	10
<input type="checkbox"/>	BZE 1	Hair	1
<input type="checkbox"/>	Cocaethylene 1	Urine	1000
<input type="checkbox"/>	Cocaethylene 1	Serum	100
<input type="checkbox"/>	Cocaethylene 1	Oral Fluid	10
<input type="checkbox"/>	Cocaethylene 1	Hair	1
<input type="checkbox"/>	Cocaine 1	Urine	1000
<input type="checkbox"/>	Cocaine 1	Serum	100
<input type="checkbox"/>	Cocaine 1	Oral Fluid	10
<input type="checkbox"/>	Cocaine 1	Hair	1
<input type="checkbox"/>	m-OH-BZE 1	Urine	10
<input type="checkbox"/>	m-OH-BZE 1	Serum	10
<input type="checkbox"/>	m-OH-BZE 1	Oral Fluid	5
<input type="checkbox"/>	m-OH-BZE 1	Hair	1

Default output

Process & Close
Print
Close
Help

## Conditional Lookup

Figure 3-4 Results Table: LRL and URL Conditional Lookup Columns

Component Name ▼	Sample ID ▼	Sample Type ▼	Calculated Concentration ▼	*LRL ▼	*URL ▼
Ecgonine 1	Oral Fluid	Unknown	0.062	0.050	1.000
EME 1	Oral Fluid	Unknown	0.054	0.075	1.000
BZE 1	Oral Fluid	Unknown	0.052	0.010	1.000
Norcocaine 1	Oral Fluid	Unknown	0.053	0.003	0.010
Cocaine 1	Oral Fluid	Unknown	0.054	0.001	0.100
Cocaethylene 1	Oral Fluid	Unknown	0.061	0.001	0.100
Ecgonine 1	Hair	Unknown	0.058	0.750	2.000
EME 1	Hair	Unknown	0.041	0.100	2.000
BZE 1	Hair	Unknown	0.055	0.025	1.000
Norcocaine 1	Hair	Unknown	0.056	0.005	0.100
Cocaine 1	Hair	Unknown	0.058	0.001	0.100
Cocaethylene 1	Hair	Unknown	0.063	0.003	0.100
Ecgonine 1	Urine	Unknown	0.077	0.050	1.000
EME 1	Urine	Unknown	0.077	0.075	1.000
BZE 1	Urine	Unknown	0.084	0.010	1.000
Norcocaine 1	Urine	Unknown	0.088	0.003	0.010
Cocaine 1	Urine	Unknown	0.096	0.001	0.100
Cocaethylene 1	Urine	Unknown	0.097	0.001	0.100
Ecgonine 1	Serum	Unknown	0.079	0.750	2.000
EME 1	Serum	Unknown	0.065	0.100	2.000
BZE 1	Serum	Unknown	0.083	0.025	1.000
Norcocaine 1	Serum	Unknown	0.086	0.005	0.100
Cocaine 1	Serum	Unknown	0.092	0.001	0.100
Cocaethylene 1	Serum	Unknown	0.102	0.003	0.100

**Example: Dilution Factor To Be Used for the Calculated Concentrations of Unknown Samples (Sample Type) Controlled by Sample Matrix Type (Sample ID)**

**Figure 3-5 Conditional Lookup Table: Output Value Set to a Dilution Factor Related to the Sample Matrix Type**

← Accept changes and return to Calculated Columns    ✕ Discard

Name:

Description:

Table Properties: Column count  +    Row count  +

Note: The "Original text" option is recommended for numeric columns that might have non-numeric values.    Treat resulting text values as  ▾

Column	Sample Type ▾	Sample ID ▾	Output
Condition	Equals ▾	Equals ▾	
<input type="checkbox"/>	Unknown	Oral Fluid	3
<input type="checkbox"/>	Unknown	Hair	2
<input type="checkbox"/>			

Default output:

## Conditional Lookup

Figure 3-6 Formula: Conditional Lookup Column Applied to Calculated Concentration

The screenshot displays the formula editor interface for a calculated column. At the top, there are navigation buttons: "Accept changes and return to Calculated Columns" and "Discard". The "Formula name" field contains "Corrected Conc." and the "Description" field contains "Recalculates Calculated Concentration of unknown samples based on dilution factor".

On the left side, there is a grid of mathematical functions and operators: COUNT, MAX, STDEV, Clear, SUM, MIN, MEDIAN, (, MEAN, ABS, IF, ), LEFT, RIGHT, ISNUMBER, +, /, \*, -, =. Below this grid are navigation arrows and a note: "Note: The 'Original text' option is recommended for formulas that contain functions, such as the IF function, that compare non-numeric values to numeric values." A dropdown menu for "Treat resulting text values as" is set to "Error (N/A)".

The main formula input area contains the expression:  $[\text{Calculated Concentration}] * [x \text{ Dil. Factor}]$ . Below this is the "Formula Details" section, which includes a "Columns" dropdown set to "x" and a "Regression parameters" list with the following items: r, r^2, Slope, Intercept, Quadratic coefficient, Linear coefficient, and Constant term.

At the bottom right, there are buttons for "Process & Close", "Print", "Close", and "Help".



Figure 3-7 Results Table: Adjusted Calculated Concentration

Component Name	Sample ID	Sample Type	Calculated Concentration	*x Dil. Factor	*Corrected Conc.	*LRL	*URL
Ecgonine 1	Oral Fluid	Unknown	0.062	3.000	0.185	0.050	1.000
EME 1	Oral Fluid	Unknown	0.054	3.000	0.162	0.075	1.000
BZE 1	Oral Fluid	Unknown	0.052	3.000	0.157	0.010	1.000
Norcocaine 1	Oral Fluid	Unknown	0.053	3.000	0.160	0.003	0.010
Cocaine 1	Oral Fluid	Unknown	0.054	3.000	0.162	0.001	0.100
Cocaethylene 1	Oral Fluid	Unknown	0.061	3.000	0.182	0.001	0.100
Ecgonine 1	Hair	Unknown	0.058	2.000	0.117	0.750	2.000
EME 1	Hair	Unknown	0.041	2.000	0.082	0.100	2.000
BZE 1	Hair	Unknown	0.055	2.000	0.109	0.025	1.000
Norcocaine 1	Hair	Unknown	0.056	2.000	0.111	0.005	0.100
Cocaine 1	Hair	Unknown	0.058	2.000	0.117	0.001	0.100
Cocaethylene 1	Hair	Unknown	0.063	2.000	0.126	0.003	0.100
Ecgonine 1	Urine	Unknown	0.077		N/A	0.050	1.000
EME 1	Urine	Unknown	0.077		N/A	0.075	1.000
BZE 1	Urine	Unknown	0.084		N/A	0.010	1.000
Norcocaine 1	Urine	Unknown	0.088		N/A	0.003	0.010
Cocaine 1	Urine	Unknown	0.096		N/A	0.001	0.100
Cocaethylene 1	Urine	Unknown	0.097		N/A	0.001	0.100
Ecgonine 1	Serum	Unknown	0.079		N/A	0.750	2.000
EME 1	Serum	Unknown	0.065		N/A	0.100	2.000
BZE 1	Serum	Unknown	0.083		N/A	0.025	1.000
Norcocaine 1	Serum	Unknown	0.086		N/A	0.005	0.100
Cocaine 1	Serum	Unknown	0.092		N/A	0.001	0.100
Cocaethylene 1	Serum	Unknown	0.102		N/A	0.003	0.100

The **Number Format Precision** of the numeric values applied in the Results Table Display Settings dialog is not included in mathematical formulas. Formulas operate on the full underlying value.

## Conditional Lookup

The same is true for the comparison of numeric values. When a conditional lookup is applied to a number in the Results Table, the number in the conditional lookup table must be the same as the full underlying value, with as many as 15 significant digits. If the comparison is made to the number shown in the Results Table, then the match might not be made.

**Figure 3-8 Number Format Precision=2**

Column Name	Visible	Number Format	Number Format Precision
Expected RT	<input checked="" type="checkbox"/>	Decimal	0.00

[← Accept changes and return to Calculated Columns](#) [✕ Discard](#)

Name:

Description:

Table Properties: Column count  [+](#) Row count  [+](#) Note: The "Original text" option is recommended for numeric columns that might have non-numeric values. Treat resulting text values as  [v](#)

[Select All Rows](#) [Delete Selected Rows](#)

Column	Component...	Expected RT	Output
Condition	Equals	Equals	
<input type="checkbox"/>	Methadone 105	2.38	On time
<input type="checkbox"/>	Tapentadol 107	1.86	On time
<input type="checkbox"/>			

Default output

[Process & Close](#) [Print](#) [Close](#) [Help](#)

Figure 3-9 Results Table: Number Format Precision=2

Component Name	Expected RT	*Numeric Comparison
Methadone 105	2.38	
Tapentadol 107	1.86	
Methadone 105	2.38	
Tapentadol 107	1.86	
Methadone 105	2.38	
Tapentadol 107	1.86	
Methadone 105	2.38	
Tapentadol 107	1.86	
Methadone 105	2.38	
Tapentadol 107	1.86	
Methadone 105	2.38	
Tapentadol 107	1.86	

## Conditional Lookup




Figure 3-10 Formula: Number Format Precision=3

Column Name	Visible	Number Format	Number Format Precision
Expected RT	<input checked="" type="checkbox"/>	Decimal	0.000000000000000

← Accept changes and return to Calculated Columns    ✕ Discard

Name:

Description:

Table Properties: Column count   Row count   Note: The "Original text" option is recommended for numeric columns that might have non-numeric values. Treat resulting text values as  

Column	Component...	Expected RT	Output
Condition	Equals	Equals	
<input type="checkbox"/>	Methadone 105	2.383	On time
<input type="checkbox"/>	Tapentadol 107	1.864	On time
<input type="checkbox"/>			

Default output:

Figure 3-11 Results Table: Number Format Precision=3

Component Name	Expected RT	*Numeric Comparison
Methadone 105	2.383000000000000	On time
Tapentadol 107	1.864000000000000	On time
Methadone 105	2.383000000000000	On time
Tapentadol 107	1.864000000000000	On time
Methadone 105	2.383000000000000	On time
Tapentadol 107	1.864000000000000	On time
Methadone 105	2.383000000000000	On time
Tapentadol 107	1.864000000000000	On time
Methadone 105	2.383000000000000	On time
Tapentadol 107	1.864000000000000	On time
Methadone 105	2.383000000000000	On time

# Formula Reference

# A

Table A-1 Functions

Function	Description
<b>ABS</b>	<p>Gets the absolute value of the specified number.</p> <p>Syntax:</p> <p><b>ABS</b> (<i>n</i>)</p> <p>Example: <b>ABS</b> (-1)</p>
<b>ACOS</b>	<p>Gets the angle with the cosine that is the value of a Results Table column or the specified number. The <b>ACOS</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>ACOS</b> (<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"><li>• <i>n</i> is the cosine, which can be specified as a Results Table column or a number.</li></ul>
<b>ASIN</b>	<p>Gets the angle with the sine that is the value of a Results Table column or the specified number. The <b>ASIN</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>ASIN</b> (<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"><li>• <i>n</i> is the sine, which can be specified as a Results Table column or a number.</li></ul>

Table A-1 Functions (continued)

Function	Description
<b>ATAN</b>	<p>Gets the angle with the arc tangent that is the value of a Results Table column or the specified number. The <b>ATAN</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>ATAN</b> (<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li><i>n</i> is the arc tangent, which can be specified as a Results Table column or a number.</li> </ul>
<b>CEILING</b> <sup>2 3</sup>	<p>Gets the smallest integer that is more than or equal to the value shown in the specified Results Table column or the specified number.</p> <p>Syntax:</p> <p><b>CEILING</b> ([<i>Results Table column</i>])</p> <p>Example: <b>CEILING</b> ([Calculated Concentration])</p>
<b>COS</b>	<p>Gets the cosine of an angle, which can be specified as the value of a Results Table column or a number. The <b>COS</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>COS</b> (<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li><i>n</i> is the angle, which can be specified as a Results Table column or a number.</li> </ul>
<b>COUNT</b>	Gets the number of items in a set.

<sup>2</sup> The function can be used for functions in functions, and with user-specified numbers.

<sup>3</sup> The user-selected column to which these functions are applied is required to be in number format.

## Formula Reference

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**Table A-1 Functions (continued)**

Function	Description
<b>EXP</b>	<p>Gets <i>e</i> raised to the specified power, which can be the value of a Results Table column or the specified number.</p> <p>Syntax:</p> <p><b>EXP</b> (<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"><li>• <i>n</i> is the power, which can be specified as a Results Table column or a number.</li></ul> <hr/> <p><b>Note:</b> If the power is more than 709, then <b>N/A</b> is shown.</p> <hr/>



Table A-1 Functions (continued)

Function	Description
<p><b>FIND</b><sup>4</sup></p>	<p>Gets the position of the specified characters in the text in a standard or custom Results Table column.</p> <p>Syntax:</p> <p><b>FIND</b> ('<i>search string</i>'; [<i>Results Table column</i>]; <i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>search string</i> is the text or numeric value to find.</li> <li>• <i>n</i> is the character position from which to start the count for a text segment.</li> </ul> <hr/> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• The <b>FIND</b> function can be used in a <b>FIND</b> or other function.</li> <li>• When the <b>FIND</b> function is used in a <b>FIND</b> function, the inner <b>FIND</b> is done first. The subsequent position is used as the start index for the outer <b>FIND</b>.</li> <li>• If the inner <b>FIND</b> gives an invalid value, that is, if the <i>search string</i> is not found, then the formula is treated as invalid and the option selected for <b>Treat resulting text values as</b> controls the output value.</li> <li>• If the <b>FIND</b> function is applied to an invalid entry and <b>Treat resulting text values as</b> is set to <b>Original text</b>, then <b>N/A</b> is shown in the related Results Table column.</li> <li>• The <b>FIND</b> function does not support wildcard characters.</li> </ul>

<sup>4</sup> Text used in this function is case sensitive.

## Formula Reference

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**Table A-1 Functions (continued)**

Function	Description
<b>FLOOR</b> <sup>2 3</sup>	<p>Gets the largest integer that is less than or equal to the number shown in the specified Results Table column or the specified number.</p> <p>Syntax:</p> <p><b>FLOOR</b>(<i>[Results Table column]</i>)</p> <p>Example: <b>FLOOR</b>(<i>[Calculated Concentration]</i>)</p>
<b>GET</b>	<p>Gets the value for the specified component.</p> <p>Syntax:</p> <p><b>GET</b>(<i>[Results-Table-column]</i>; '<i>Component-Name</i>')</p>
<b>GETGROUP</b>	<p>Gets the value for the specified transition in a group.</p> <p>Syntax:</p> <p><b>GETGROUP</b>(<i>[Results-Table-column]</i>; <i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li><i>n</i> is the number of the transition in the group.</li> </ul> <hr/> <p><b>Note:</b> If no groups are identified in the Components section, then the <b>GETGROUP</b> functions treats all components as members of the same group.</p>
<b>GETSAMPLE</b> <sup>5 6</sup>	<p>Gets values from a standard or custom Results Table column for the sample of the selected type.</p> <p>Syntax:</p> <p><b>GETSAMPLE</b>(<i>[Results Table column]</i>; '<i>Sample Name</i>')</p> <p>Example: <b>GETSAMPLE</b>(<i>[Area]</i>; '<i>Low QC</i>')</p>

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<sup>5</sup> If multiple samples have the same *Sample Name*, then the software supplies data from the first processed sample that has a match.

<sup>6</sup> If the specified *Sample Name* is not found in the Results Table, then the result is controlled by the option selected for **Treat resulting text values as**.

Table A-1 Functions (continued)

Function	Description
<b>GETSAMPLECLOSEST</b> <sup>7 8 9 10 11</sup>	<p>Gets the value from a standard or custom Results Table column for the sample of the selected type that has a value closest to the user-specified value.</p> <p>Syntax:</p> <pre>GETSAMPLECLOSEST([Results Table column 1]; [Results Table column 2])</pre> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>Results Table column 1</i> is the output value.</li> <li>• <i>Results Table column 2</i> is the input value.</li> </ul> <p>Example<sup>12</sup>: <b>GETSAMPLECLOSEST</b> ([Ion Ratio]; [Area])</p>
<b>GETSAMPLECLOSESTLOW</b> <sup>7 8 9 10 11</sup>	<p>Gets the value from a standard or custom Results Table column for the closest sample of the selected type that has a value less than or equal to the user-specified value.</p> <p>Syntax:</p> <pre>GETSAMPLECLOSESTLOW([Results Table column 1]; [Results Table column 2])</pre> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>Results Table column 1</i> is the output value.</li> <li>• <i>Results Table column 2</i> is the input value.</li> </ul> <p>Example<sup>12</sup>: <b>GETSAMPLECLOSESTLOW</b> ([Ion Ratio]; [Area])</p>

<sup>7</sup> The input value must be a numeric column.

<sup>8</sup> The function uses the precision of the numeric value in the stored data for the comparison, not the precision configured in the Results Table.

<sup>9</sup> If multiple processed samples have the same input value, then the software supplies data from the first processed sample that has a match.

<sup>10</sup> If the specified input value is not in the Results Table, then the result is controlled by the option selected for **Treat resulting text values as**.

<sup>11</sup> Sample type selection is available for the input value.

<sup>12</sup> Line breaks are not valid in formulas. If a formula is pasted into the formula field, then remove the line breaks.

## Formula Reference

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**Table A-1 Functions (continued)**

Function	Description
<p><b>GETSAMPLECLOSESTHIGH</b> <sup>7 8 9 10 11</sup></p>	<p>Gets the value from a standard or custom Results Table column for the closest sample of the selected type that has a value more than or equal to the user-specified value.</p> <p>Syntax:</p> <pre>GETSAMPLECLOSESTHIGH([Results Table column 1]; [Results Table column 2])</pre> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>Results Table column 1</i> is the output value.</li> <li>• <i>Results Table column 2</i> is the input value.</li> </ul> <p>Example<sup>12</sup>: <b>GETSAMPLECLOSESTHIGH</b> ([Ion Ratio]; [Area])</p>
<p><b>GETSAMPLEEQUAL</b> <sup>7 8 9 10 11</sup></p>	<p>Gets the value from a standard or custom Results Table column for the sample of the selected type that has a value equal to the user-specified value.</p> <p>Syntax:</p> <pre>GETSAMPLEEQUAL ([Results Table column 1]; [Results Table column 2])</pre> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>Results Table column 1</i> is the output value.</li> <li>• <i>Results Table column 2</i> is the input value.</li> </ul> <p>Example: <b>GETSAMPLEEQUAL</b> ([Ion Ratio]; [Area])</p>

Table A-1 Functions (continued)

Function	Description
GETSTAT	<p>Adds the <b>Mean, Standard Deviation, Percent CV</b>, or <b>Average Accuracy across Replicates</b> column shown in the Statistics pane to the Results Table.</p> <p>Syntax:</p> <pre>GETSTAT ('Statistics-pane-column'; 'Metric'; 'Grouping')</pre> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>Statistics-pane-column</i> must be exactly the same as the name of the column that shows Statistics pane.</li> <li>• <i>Metric</i> is the property for which the statistic will be calculated. Statistics can be calculated for <b>Calculated Concentration, Area, Height, and Calibration Y-Value</b>.</li> <li>• (Optional) <i>Grouping</i> specifies how the samples for an analyte will be put into groups for the calculation of the statistics. The following options are available: <b>Actual Concentration, Sample Name, Sample ID, Sample Name prefix, Sample Comment, Barcode, Scanned Barcode, and Injection position</b>. If a grouping option is not specified, then <b>Actual Concentration</b> is used.</li> </ul> <p><b>Note:</b> If a grouping option is not selected, then <b>GETSTAT</b> extracts statistical values (mean, standard deviation, %CV and average accuracy across replicates), for standard and QC sample types, grouped by actual concentration.</p>

Table A-1 Functions (continued)

Function	Description
<p><b>GETVALUE</b><sup>8</sup></p>	<p>Compares the values in two Results Table columns or a Results Table column and a user-specified value. When the values are the same, the function gets the value of a third Results Table column. The <b>GETVALUE</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>GETVALUE</b>([Results Table Column 1]);n1; [Results Table Column 2]</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>Results Table Column 1</i> is the column from which the function will get the value when <i>n1</i> is the same as <i>Results Table Column 2</i>.</li> <li>• <i>n1</i> is the column or user-specified value to be used in the comparison. <i>n1</i> can be a Results Table column, calculated column, custom text column, number, or text. Columns must be in brackets: []. Text must be in single quotation marks. Numbers must not be in quotation marks.</li> <li>• <i>Results Table Column 2</i> is a Results Table column, calculated column, or custom text column to be used in the comparison.</li> </ul> <hr/> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• If more than one sample has the same input value, then the function gets the data from the first sample that is processed.</li> <li>• If the input values are not found in the Results Table, then the result is controlled by the option selected for <b>Treat resulting text values as</b>.</li> <li>• Sample type selection is available for the input value.</li> </ul>

Table A-1 Functions (continued)

Function	Description
<b>IEEEREMAINDER</b>	<p>Gets the remainder that is the result of division of a Results Table column or user-specified number by a Results Table column or user-specified number. The <b>IEEEREMAINDER</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>IEEEREMAINDER</b> (<i>n1</i>; <i>n2</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>n1</i> is the dividend, or number to be divided, which can be specified as a Results Table column or a number.</li> <li>• <i>n2</i> is the divisor, which can be specified as a Results Table column or a number.</li> </ul>

Table A-1 Functions (continued)

Function	Description
<p><b>IF</b></p>	<p>Does a logical test, and then gives a true or false result. Use nested <b>IF</b> functions to test more than one condition. The <b>IF</b> function can be combined with other logical functions such as <b>and</b> and <b>or</b> to extend a logical test.</p> <p>Syntax:</p> <p><b>IF</b>(<i>condition</i>; <i>value if true</i>; <i>value if false</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>condition</i> is a value or logical expression that can be found to be true or false.</li> <li>• <i>value if true</i> is a value to be shown in the related Results Table column when the <i>condition</i> is true.</li> <li>• <i>value if false</i> is a value to be shown in the related Results Table column when <i>condition</i> is false.</li> </ul> <hr/> <p><b>Note:</b> The <b>IF</b> function symbol can be selected from the calculator, typed, or copied from another source. The <b>IF</b> function is not case sensitive.</p> <hr/> <p><b>Note:</b> The characters <b>&amp;&amp;</b> and <b>  </b> can be used for <b>and</b> and <b>or</b>, respectively. The <b>and</b> and <b>or</b> operators must be surrounded by spaces, but the <b>&amp;&amp;</b> and <b>  </b> operators do not.</p> <hr/> <p>The numeric functions can be used in a formula with an <b>IF</b> function. Numeric functions, for example <b>MEAN</b> and <b>STDEV</b>, can be used in the <i>condition</i>, <i>value if true</i>, or <i>value if false</i> expressions.</p> <p><b>IF</b> conditions can test confidence traffic lights for these columns:</p> <ul style="list-style-type: none"> <li>• <b>Mass Confidence</b></li> <li>• <b>Fragment Mass Error Confidence</b></li> <li>• <b>RT Confidence</b></li> <li>• <b>Isotope Confidence</b></li> </ul>



Table A-1 Functions (continued)

Function	Description
	<ul style="list-style-type: none"> <li>• <b>Library Confidence</b></li> <li>• <b>Formula Confidence</b></li> <li>• Combined rules</li> </ul> <p>Confidence traffic lights can be tested for the values <b>Green, Yellow, Red, or Grey</b>.</p>
<b>IN</b>	<p>Identifies if an element is in a set of values. If the element is in the set, then <code>true</code> is supplied. If the element is not in the set, then <code>false</code> is supplied.</p> <p>Syntax:</p> <p><b>IN</b> ([<i>Results Table column</i>]   <i>number</i>   <i>string</i>   <i>function</i>; <i>value 1</i>; <i>value 2</i>; <i>value 3</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>Results Table column</i>, <i>number</i>, <i>string</i>, or <i>function</i> is specified to search a Results Table column, number, text string, or function.</li> <li>• <i>value 1</i>; <i>value 2</i>; <i>value 3</i> is a list of up to 100 values to be found in the set. Values can be numbers, text, or functions.</li> </ul> <p>Example: <b>IN</b>([Actual Concentration]; 1;2;3)</p>
<b>INTERCEPT</b>	<p>Gets the point where the graph of a function or relation intersects with the opposite axis of the coordinate system.</p> <p>Syntax:</p> <ul style="list-style-type: none"> <li>• <b>INTERCEPT</b> ([<i>X-value</i>]; [<i>Y-value</i>])</li> <li>• <b>INTERCEPT</b> ([<i>Y-value</i>])</li> </ul> <hr/> <p><b>Note:</b> If only one value is specified, then it is used as the <i>Y-value</i>, and <b>Actual Concentration</b> is used as the <i>X-value</i>.</p> <hr/> <p><b>INTERCEPT</b> refers to the linear regression (<math>y = ax + b</math>).</p>

Table A-1 Functions (continued)

Function	Description
<p><b>ISNUMBER</b></p>	<p>Identifies a value in a cell in the Results Table as numeric or non-numeric. If the value is a number, then <code>true</code> is supplied. If the value is not a number, then <code>false</code> is supplied.</p> <p>Syntax:</p> <p><b>ISNUMBER</b>(<i>[Results Table column]</i>)</p> <p>Example<sup>12</sup>: <b>ISNUMBER</b>(<i>[Calculated Concentration]</i>)</p> <hr/> <p><b>Note:</b></p> <p>When <b>ISNUMBER</b> is used in complex statements, such as with an <b>IF</b> function, then the result (<code>true</code> or <code>false</code>) must be lowercase and not in quotation marks.</p> <p>Example: <b>IF</b>(<b>ISNUMBER</b>(<i>[Area]</i>) = <code>true</code>; 'compound present'; 'compound not present')</p>
<p><b>LEFT</b> <sup>13 14 15</sup></p>	<p>Gets a specified number of characters from the start of the text.</p> <p>Syntax:</p> <p><b>LEFT</b>(<i>[Results Table column]</i>; <i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li><i>n</i> is the quantity of characters to get.</li> </ul> <p>Example: <b>LEFT</b>(<i>[Sample ID]</i>; 4)</p>
<p><b>LOG</b></p>	<p>Gets the logarithm of the value of a Results Table column or the specified number.</p> <p>Syntax:</p> <p><b>LOG</b>(<i>1</i>; <i>10</i>)</p>

<sup>13</sup> The function can be used with other functions.

<sup>14</sup> The function can be used in number, text, or Boolean columns.

<sup>15</sup> The function is recommended for use in text columns.

Table A-1 Functions (continued)

Function	Description
<b>LOG10</b>	Gets the base 10 logarithm of the value of a Results Table column or the specified number.  Syntax: <b>LOG10</b> (1)
<b>MAD</b>	(Median absolute deviation) Gets a measure of the variability of a univariate sample of quantitative data. The <b>MAD</b> function is not available on the calculator, but can be typed.
<b>MAX</b>	Gets the largest value in a set.
<b>MEAN</b>	Gets the sum of a list of numbers divided by the number of numbers in the list.
<b>MEDIAN</b>	Gets the value that divides the higher half of a data sample, population, or probability distribution from the lower half.
<b>MIN</b>	Gets the smallest value in a set.
<b>POW</b>	Gets a specified number raised to the specified power.  Syntax: <b>POW</b> (n1; n2)  Where: <ul style="list-style-type: none"> <li>• n1 is the number to be raised, which can be specified as a Results Table column, function, or number.</li> <li>• n2 is the power, which can be specified as a Results Table column, function, or number.</li> </ul> Example: <b>POW</b> (2, 3)  <b>Note:</b> If the result is more than 1.7E+308, then <b>N/A</b> is shown.

## Formula Reference

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**Table A-1 Functions (continued)**

Function	Description
<b>RIGHT</b> <sup>13 14 15</sup>	<p>Gets the specified number of characters from the end of the text.</p> <p>Syntax:</p> <p><b>RIGHT</b> ([<i>Results Table Column</i>];<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"><li>• <i>n</i> is the number of characters to get.</li></ul> <p>Example: <b>RIGHT</b> ([Barcode];3)</p>
<b>ROUND</b> <sup>2 3</sup>	<p>Rounds the number in the specified Results Table column or specified by the user to the nearest integer or specified number of decimal places.</p> <p>Syntax:</p> <p><b>ROUND</b> ([<i>Results Table column</i>];<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"><li>• <i>n</i> is the number of decimal places.<ul style="list-style-type: none"><li>• If <math>n &gt; 0</math>, then the number is rounded to the specified number of decimal places.</li><li>• If <math>n = 0</math>, then the number is rounded to the nearest integer, that is, no decimal places are used.</li><li>• If <math>n &lt; 0</math>, then the number is rounded to the left of the decimal point.</li></ul></li></ul> <p>Example: <b>ROUND</b> ([Calculated Concentration];0)</p>

Table A-1 Functions (continued)

Function	Description
<b>SEARCH</b> <sup>13 16 17</sup>	<p>Gets the position of the specified characters in the text in a standard or custom Results Table column.</p> <p>Syntax:</p> <p><b>SEARCH</b>('search string'; [Results Table column]};n)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>search string</i> is the text or numeric value to find.</li> <li>• <i>n</i> is the character position from which to start the count for a text segment.</li> </ul> <p><b>SEARCH</b> supports the use of wildcard characters. Refer to the table: <a href="#">Table A-2</a>.</p>
<b>SIGN</b>	<p>Gets a value that identifies the sign of the value of a Results Table column or the specified number. The <b>SIGN</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>SIGN</b>(<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>n</i> is the power, which can be specified as a Results Table column or a number.</li> </ul>

<sup>16</sup> Text used in this function is not case sensitive.

<sup>17</sup> If the *search string* is not found, then the result is controlled by the option selected for **Treat resulting text values as**. If **Treat resulting text values as** is set to **Original text**, then the function gets **N/A**.

Table A-1 Functions (continued)

Function	Description
<p><b>SIN</b></p>	<p>Gets the sine of a specified angle, specified as the value of a Results Table column or a number. The <b>SIN</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>SIN</b> (<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>n</i> is the angle, which can be specified as a Results Table column or a number.</li> </ul>
<p><b>SLOPE</b></p>	<p>Gets a number that identifies both the direction and steepness of the line. Also referred to as <i>gradient</i>.</p> <p>Syntax:</p> <ul style="list-style-type: none"> <li>• <b>SLOPE</b> ([<i>X-value</i>]; [<i>Y-value</i>])</li> <li>• <b>SLOPE</b> ([<i>Y-value</i>])</li> </ul> <hr/> <p><b>Note:</b> If only one value is specified, then it is used as the <i>Y-value</i>, and <b>Actual Concentration</b> is used as the <i>X-value</i>.</p> <hr/> <p><b>SLOPE</b> refers to the linear regression (<math>y = ax + b</math>).</p>
<p><b>SQRT</b></p>	<p>Gets the square root of the value of a Results Table column or the specified number.</p> <p>Syntax:</p> <p><b>SQRT</b> (<i>n</i>)</p>
<p><b>STDEV</b></p>	<p>(Standard deviation) Gets a measure that is used to quantify the amount of variation or dispersion of a set of data values.</p>

Table A-1 Functions (continued)

Function	Description
<b>SUBSTITUTE</b> <sup>4 13</sup>	<p>Makes a column in the Results Table that replaces an alphanumeric value with another alphanumeric value from a standard or custom Results Table column.</p> <p>Syntax:</p> <p><b>SUBSTITUTE</b>([Results Table column];'original alphanumeric value';'new alphanumeric value';n)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>n</i> (optional) is the occurrence of the <i>original alphanumeric value</i> that will be replaced with the <i>new alphanumeric value</i>. If <i>n</i> is specified, then only the <i>n</i>th instance of the value is replaced. Otherwise, every instance of the old value is changed to the new value.</li> </ul> <p>Example: <b>SUBSTITUTE</b>([Sample Name]; 'STD'; 'STD_00')</p>
<b>SUM</b>	Gets the sum of the list of numbers in a set.
<b>TAN</b>	<p>Gets the tangent of an angle, which can be specified as the value of a Results Table column or a number. The <b>TAN</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>TAN</b>(<i>n</i>)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>n</i> is the angle, which can be specified as a Results Table column or a number.</li> </ul>

**Table A-1 Functions (continued)**

Function	Description
<p><b>TEXT</b></p>	<p>Applies format codes to a number to change how the number is shown. The function can be used to show numbers in a more readable format, or to use numbers, text, and symbols together. Formatting can be applied to number or text columns. Formatting cannot be applied to Boolean columns. The <b>TEXT</b> function is not available on the calculator, but can be typed.</p> <p>Syntax:</p> <p><b>TEXT</b> ([Results Table Column]; 'format code')</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• <i>Results Table Column</i> is the column to be formatted.</li> <li>• <i>format code</i> controls how the content of the column is shown. Refer to the tables: <a href="#">Table A-3</a> to <a href="#">Table A-9</a>.</li> </ul>
<p><b>TRIM</b> <sup>13</sup></p>	<p>Removes extra spaces from text. All leading, trailing, and internal spaces, except for those that divide words, are removed from a standard or custom Results Table column.</p> <p>Syntax:</p> <p><b>TRIM</b> ([Results Table column])</p> <p>Example: <b>TRIM</b> ([Barcode])</p>
<p><b>TRUNCATE</b></p>	<p>Gets the integral part of a number in a Results Table column.</p> <p>Syntax:</p> <p><b>TRUNCATE</b> ([Results Table column])</p>



**Table A-2 Wildcard Characters**

Wildcard Character	Description
?	<p>A question mark (?) finds any single character.</p> <p>Example: <b>SEARCH</b>('?ard';[Component Comment];1)</p> <p>?ard finds card in the text <i>Test wild card characters (?) and (*)</i>. The return position is 11.</p> <hr/> <p><b>Note:</b></p> <p>To search for a question mark (?), type a backslash (\) before the character.</p> <p>Example: <b>SEARCH</b>('\'?';[Component Comment];1)</p> <p>\? finds ? in the text <i>Test wild card characters (?) and (*)</i>. The return position is 28.</p>
*	<p>An asterisk (*) finds any sequence of characters.</p> <p>Example: <b>SEARCH</b>('*ard';[Component Comment];1)</p> <p>*ard finds Test wild card in the text <i>Test wild card characters (?) and (*)</i>. The return position is 1.</p> <hr/> <p><b>Note:</b></p> <p>To search for an asterisk (*), type a backslash (\) before the character.</p> <p>Example: <b>SEARCH</b>('\'*';[Component Comment];1)</p> <p>\* finds * in the text <i>Test wild card characters (?) and (*)</i>. The return position is 36.</p>

**Format Codes**

**Table A-3 Year**

Format	Format Code	Syntax	Example Result
00 to 99	yy	<b>TEXT</b> ([Results Table Column];'yy')	23

## Formula Reference

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**Table A-3 Year (continued)**

Format	Format Code	Syntax	Example Result
1900 to 9999	YYYY	<b>TEXT</b> ([Results Table Column]; 'YYYY')	2023

**Table A-4 Month**

Format	Format Code <sup>18</sup>	Syntax	Example Result
1 to 12	M	<b>TEXT</b> ([Results Table Column]; 'M')	9
01 to 12	MM	<b>TEXT</b> ([Results Table Column]; 'MM')	09
Jan to Dec	MMM	<b>TEXT</b> ([Results Table Column]; 'MMM')	Sep
January to December	MMMM	<b>TEXT</b> ([Results Table Column]; 'MMMM')	September

**Table A-5 Day**

Format	Format Code	Syntax	Example Result
1 to 31	d	<b>TEXT</b> ([Results Table Column]; 'd')	4
01 to 31	dd	<b>TEXT</b> ([Results Table Column]; 'dd')	04
Sun to Sat	ddd	<b>TEXT</b> ([Results Table Column]; 'ddd')	Mon
Sunday to Saturday	dddd	<b>TEXT</b> ([Results Table Column]; 'dddd')	Monday

**Table A-6 Hours**

Format	Format Code	Syntax	Example Result
0 to 12 (12-hour clock)	h	<b>TEXT</b> ([Results Table Column]; 'h')	9

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<sup>18</sup> The format code is case sensitive. A lowercase *m* is used to format minutes.

**Table A-6 Hours (continued)**

Format	Format Code	Syntax	Example Result
01 to 12 (12-hour clock)	hh	<b>TEXT</b> ([Results Table Column]; 'hh')	09
AM or PM (12-hour clock)	AM/PM	<b>TEXT</b> ([Results Table Column]; 'h AM/PM')	9 PM
0 to 24 (24-hour clock)	H	<b>TEXT</b> ([Results Table Column]; 'H')	21
00 to 24 (24-hour clock)	HH	<b>TEXT</b> ([Results Table Column]; 'HH')	09

**Table A-7 Minutes**

Format	Format Code	Syntax	Example Result
0 to 59	m	<b>TEXT</b> ([Results Table Column]; 'm')	7
00 to 59	mm	<b>TEXT</b> ([Results Table Column]; mm)	07

**Table A-8 Seconds**

Format	Format Code	Syntax	Example Result
0 to 59	s	<b>TEXT</b> ([Results Table Column]; 's')	2
00 to 59	ss	<b>TEXT</b> ([Results Table Column]; ss)	02

**Table A-9 Numbers**

Format	Format Code	Syntax	Example Result
Decimal places	Decimal separator followed by one 0 for each required decimal place	<b>TEXT</b> ([Results Table Column]; '#.00')	.24

## Formula Reference

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**Table A-9 Numbers (continued)**

<b>Format</b>	<b>Format Code</b>	<b>Syntax</b>	<b>Example Result</b>
Zero in the ones place for numbers less than one	0 in the ones place	<b>TEXT</b> ([Results Table Column]; '0.000')	0.245
Percentage	%	<b>TEXT</b> ([Results Table Column]; '0%')	24%
Thousands separator	# or 0 for each digit up to the thousands place, with the required separator in the correct location	<b>TEXT</b> ([Results Table Column]; #,###)	12,200,000
Scientific notation	E+0	<b>TEXT</b> ([Results Table Column]; '0.0E+0')	1.2E+7

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- In North America: [NA.CustomerTraining@sciex.com](mailto:NA.CustomerTraining@sciex.com)
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- [sciex.com/contact-us](http://sciex.com/contact-us)
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