

TOPIC	KEY POINTS
<p>Simple math:</p> <pre>+ - / * ^ log() cos() acos() abs() sqrt() pi() factorial()</pre>	<p>R can perform like a regular calculator and there are a range of mathematical operators and functions that can be used. Use <code>help(Arithmetic)</code> in R to get more information.</p>
<p>Assigning object names:</p> <pre>Object.name = calculation Object.name - calculation calculation -> Object.name</pre>	<p>Results of calculations can be stored as named objects. The <code>=</code> and <code>-</code> symbols enable you to create an object from the result of the following calculation (in other words, you assign from right to left). The <code>-></code> symbol enables you to assign the results of a calculation to a named object (that is, you assign from left to right).</p>
<p>Object names for example:</p> <pre>data1 Data1 data.1</pre>	<p>Objects are allowed names using all the letters a–z and uppercase A–Z as well as the numbers 0–9. A name must begin with a letter. The only punctuation mark allowed is a period. Names are case sensitive.</p>
<p>Making data:</p> <pre>object.name = c(x, y, z)</pre>	<p>The <code>c()</code> command allows the concatenation of several items. It can be used to create data samples, for example.</p>
<p>Making data:</p> <pre>object.name = scan()</pre>	<p>The <code>scan()</code> command allows data items to be entered from the keyboard, clipboard, or a simple text file.</p>
<p>Making data:</p> <pre>object.name = read.table(file =)</pre>	<p>The <code>read.table()</code> command allows a text file to be read from disk. The resulting object is a data frame with columns of equal length; short columns are padded out with <code>NA</code>.</p> <p>The <code>read.csv()</code> command is a special case of the command with defaults set for CSV files.</p>
<p>Listing objects:</p> <pre>ls(pattern = regex) rm(item1, item2,)</pre>	<p>The <code>ls()</code> command lists all the objects currently in memory. The <code>rm()</code> command removes objects (thereby deleting them). The list can use a regular expression and refine the result by listing only certain names.</p>

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Data type: numerical (numeric, integer) character (factor, character)	Data can be in one of two major types, numerical for numbers or character for text. Number data can be integer or numeric. Text data can be classed as factor or character. The latter is a general type and items are shown enclosed in quotes. Factor data are text but not quoted.
Data form: vector data frame matrixlist	Data can be in one of several forms. A one-dimensional structure is a vector. Data in 2D form can be a data frame or a matrix. In a matrix all the data of the same type. A data frame can contain mixtures of data (for example, numeric and factor). Missing values and “short” columns are padded with NA. A list object is a collection of other objects and can contain items of different lengths and types.
History commands: history() loadhistory() savehistory()	Previously executed commands can be viewed using the up and down arrow keys. The entire history can be viewed using the <code>history()</code> command and files of commands can be loaded from or saved to disk.
Saving and loading data: save(x, y, z, , file =) save.image(file =) write(x, file =) write.csv(data, file =) load(file =)	When closing R all data can be saved to the default .RData file. The <code>save()</code> command can be used to save one or more objects to a file. The <code>save.image()</code> command can be used to save all objects to a file. The resulting files can be recalled using the <code>load()</code> command. A plain text representation of a data object can be saved to disk using the <code>write()</code> or <code>write.csv()</code> commands.
Finding data on disk: dir() getwd() setwd() file.choose()	The <code>dir()</code> command allows the listing of files stored on disk. The working directory is where files are looked for and stored to by default. The location of the current working directory can be ascertained using <code>getwd()</code> . The working directory can be set to a new location using the <code>setwd()</code> command. Filenames must be specified explicitly but on Windows and Mac systems <code>file.choose()</code> can be used in place of a name, allowing a file to be selected by the user.
