

AlgebraCalc

v. 1.00

**Multi-purpose Algebraic Math and Unit
Conversion Calculator for Palm® OS**

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AlgebraCalc - Palm® OS

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The short version:

We strive to be perfect, but...

The long version:

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Introduction

AlgebraCalc is a multi-purpose math and unit conversion calculator application for Palm OS handhelds. It uses algebraic precedence rules to perform calculations, thus multiplication and division are performed before addition and subtraction: $1 + 2 \times 3 = 7$. It has a 9-digit display, 22 math and trigonometric functions, and 269 unit conversion functions. A set of 8 custom function keys can be assigned up to 24 user-selected functions, which can be changed at any time.

Installation

AlgebraCalc consists of two component files:

- `algebracalc.prc` - the application program (160k)
- `mathlib.prc` - shared library of math functions (50k)

AlgebraCalc requires Palm OS 3.0 or higher, and HotSync version 2.1 or higher.

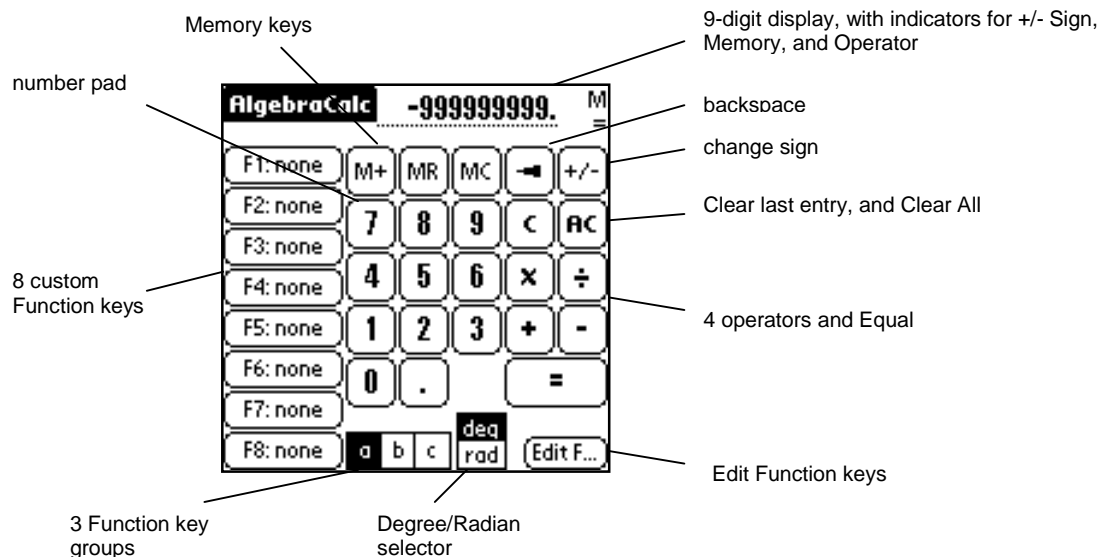
Mathlib.prc must be installed on your handheld device to use the advanced math functions. Your handheld may already have Mathlib built in (like the Handspring Visor); you would not have to install it.

Install each file on your handheld device by double-clicking on it, and then perform a HotSync.

A note about Mathlib.prc: Mathlib is a free shared library that can be used by any Palm OS 2.0 program that needs IEEE 754 double precision math functions. It's distributed under the terms of the GNU General Public license, and is freely available with full source code and documentation at the: <http://www.radiks.net/~rhuebner/mathlib.html> information web page. It's not a part of the AlgebraCalc program, and you're not paying anything for its use; a copy is simply included in this distribution of AlgebraCalc for your convenience.


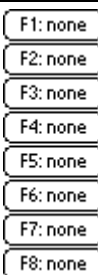



AlgebraCalc Application Overview

Main Form Components



Calculator Buttons:

Button:	Name:	Description:
	9-digit display	shows current number, has indicators for sign, memory, and operator
	backspace	remove one digit to the left
	change sign	toggle the sign on the currently displayed number
	Clear	clear the last number entered from the calculation, allow re-entry of a corrected value.
	All Clear	clear the calculator totals and reset the display. Note: this does NOT clear the memory
	multiply	multiply the previous entry or result by the next entered value
	divide	divide the previous entry or result by the next entered value
	add	add the next entered value to the previous entry or result
	subtract	subtract the next entered value from the previous entry or result
	equal	finish the calculation with a total
	Memory Add	add currently displayed number to value in memory, and show the Memory indicator: M in the upper right corner of the display
	Memory Recall	display the memory contents
	Memory Clear	reset the memory contents to zero, and remove the Memory indicator: M from the display

Calculator Buttons: (continued)		
	number pad and decimal	enter numeric digits and decimal
	function keys (F-keys)	perform displayed function or conversion
	function key groups	switch the displayed function keys between one of three groups: a, b, or c
	Degree/Radian selector	switch between Degree or Radian input when using trigonometric functions
	Edit Function keys	display the Edit F form to assign and change the Function keys

Sample Calculations, Functions, and Display Messages

This section illustrates the use of the calculator and its functions. Let's assume you have assigned the F-keys in group: **a** as shown on the sample form below. (See the section: **Edit F-keys** for instructions on how to do this)



Note: You should always tap the **AC** (All Clear) key to reset the calculator before starting any new calculations.

Operator Precedence:

The calculator uses algebraic precedence rules, so that multiplication and division are performed before addition and subtraction. The calculation: $1 + 2 \times 3 = 7$ is entered in the same order it is written.

The function keys operate immediately on the currently displayed number. Tap a function key before tapping the next operator, or you may get erratic results.

Memory Keys:

The memory keys allow you to:

- **M+** add the current display value to memory; and display the Memory indicator "M"
- **MR** recall memory value and display it;
- **MC** clear the memory by resetting its contents to zero; and remove the Memory indicator.

Note that tapping the **AC** (All Clear) key does not clear the memory. To clear the memory, tap the **MC** (Memory Clear) key.

Function Keys:

The function keys always work on the currently displayed number. It makes no difference if the currently displayed number is the result of a previous calculation, or a number entered directly by the user.

For example, if the calculator is displaying the number: **16**, as shown above, then tapping some of the function keys shown on the sample form will give the following results:

Using Sample Function Keys:		
tapping this function:	will display this:	because the function was:
x2	256.	16 squared = 256.
sqrt x	4.	square root of 16 = 4.
deg C:deg F	60.8	16 degrees Celsius = 60.8 degrees Fahrenheit
cu ft:cu yd	0.59248	16 cubic feet = 0.59248 cubic yards

Sample Complex Calculations:

$$45 + \sin(30) = 45.5$$

Enter:	Tap:	Display Shows:
	deg	0.
45	+	45.
30	sin	0.5
	=	45.5

$$(3)^2 + (2)^3 = 17$$

Enter:	Tap:	Display Shows:
3	x2	9.
	+	9.
2	x3	8.
	=	17.

Trigonometric Functions:

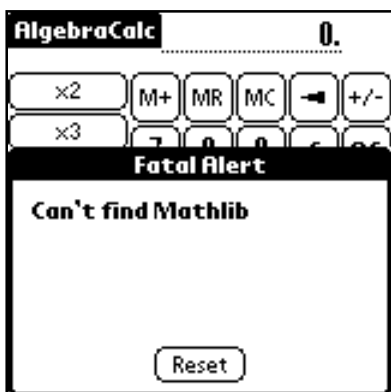
Trigonometric functions, like: $\sin(x)$ can accept as input a number displayed in units of degrees or radians. Always check the position of the deg/rad selector to ensure using the correct units.

Error Messages:

Some calculations may result in one of the messages show below:

Displayed Error Messages:	
Display Message:	Appears when:
-DIV-0-	division by zero attempted
-OVRFL-	Overflow: numeric result of calculation has too many digits to fit the display
-ERROR-	calculation is undefined. For example: $\tan(90 \text{ deg})$

These error messages will lock the calculator. To remove the message from the display and reset the calculator, tap the: **AC** button (All Clear).



Most math functions (including trig functions) require the mathlib.prc to be installed on your handheld device, otherwise a Fatal Alert error will occur, requiring a reset.

Function Keys (F-keys)

The set of 8 custom function keys (called: F-keys) on the left side of the screen can be assigned up to 24 user-selected functions, and can be changed at any time. The 24 functions are displayed 8 functions at a time, and you switch between them by selecting group **a**, group **b**, or group **c**.

AlgebraCalc has 22 math and trig functions, and 269 unit conversion functions built in. These functions are selected from a list and assigned to specific keys using the **Edit F** form, as described below.

The function list is arranged with the 22 math functions in no particular order, then a line which separates them from the 269 unit conversion functions, which are arranged alphabetically. This is a long list, but the functions are displayed 10 at a time to reduce the amount of scrolling, and the list "remembers" its position during multiple F-key assignments.

Conversion functions are listed using the shorthand format:

convert from this unit : to this unit

with the colon separating the "from" and "to" units.

Abbreviations are used throughout, as the conversion descriptions must be as short as possible to be displayed on the calculator F-keys. These abbreviations attempt to follow standard conventions, but some creativity was used, especially in cases where special characters are involved (for example, listing degrees Fahrenheit as: deg F, instead of °F)

In the cases where even the function abbreviation is too long to fit the F-key display, the display is cut short and followed by "..." to indicate the truncation. Tapping such a function key displays a message listing the complete function and allows you to execute or skip it.

For example, the conversion function:

miles/gallon (Imperial) to litres/100 kilometers

is abbreviated as:

mi/gal Imp:l/100 km

which is still too long to fit the F-key, and is displayed as:

mi/gal Imp...

Notice the three dots indicating a truncated display. Tapping this function key will display the message:



Tap: **Yes** to execute the function, or: **No** to skip it.

The complete list of built-in functions is shown in Appendix A.

Edit F-keys

Tapping the **Edit F** button on the main form displays the **Edit F-keys** form:

The basic instructions are listed at the top of the form. You can assign a single F-key, or as many as you like, before leaving this form. You may also return to change or add F-key assignments at any time.

Functions can be assigned to any F-key, in any order desired. For example, you may find it useful to assign your most commonly used functions to the 8 F-keys in group: **a**, with less commonly used functions in groups: **b** and **c**. Another method might be to assign math functions to group: **a**, and unit conversions to the others. In any case, you can switch instantly between groups by tapping: **a**, **b**, or **c** on the calculator.

Assigning a function to an F-key requires 4 steps:

1. select an F-key group, either **a**, **b**, or **c**
2. choose a specific F-key to assign, from **F1** to **F8**
3. choose a specific function from the drop-down list
4. tap: **Save** to complete the assignment

If desired, assign additional F-keys by repeating the four steps above for each different F-key.

IMPORTANT! Remember to tap: **Save** after each assignment to properly record your choice, or no change will occur.

When you are done with this form, tap: **Calculator** to return to the main form, or tap: **List F** to view a complete list of assigned function keys (described in the next section titled: List F-keys).

List F-keys

To display a form listing all your F-key assignments, tap the: **List F** button on bottom of the **Edit F-keys** form.

View the 8 F-keys in each group by tapping the group name: **a**, **b** or **c**, for a total of 24 F-keys.

sample group: **a**

AlgebraCalc List F-keys

F-key Group: a b c

F1: x2

F2: x3

F3: sqrt x

F4: cu ft:cu in

F5: cu ft:cu yd

F6: deg C:deg F

F7: deg F:deg C

F8: atm:PSI

OK
Edit F...

sample group: **b**

AlgebraCalc List F-keys

F-key Group: a b c

F1: goz

F2: F2: none

F3: F3: none

F4: F4: none

F5: F5: none

F6: F6: none

F7: F7: none

F8: F8: none

OK
Edit F...

sample group: **c**

AlgebraCalc List F-keys

F-key Group: a b c

F1: F1: none

F2: F2: none

F3: F3: none

F4: F4: none

F5: F5: none

F6: F6: none

F7: F7: none

F8: F8: none

OK
Edit F...

The assignments are listed in full, making it easy to read those function names which may be too long to fit in the F-keys on the calculator. Any F-key which has no assigned function will show a message like: **F2: none**

This form does not allow you to make changes to the F-key assignments. To make changes, tap the: **Edit F** button to display the **Edit F-keys** form.

Tap: **OK** to return to the calculator.

Tips

The built-in tips can be displayed from any form by first tapping the menu button on your handheld device to call up the menu, and then tapping menu item: **Tips**. Use the scroll buttons to view the listed tips.

AlgebraCalc Tips

*** Calculations are processed using algebraic precedence, so multiplication and division are done before addition and subtraction: $1 + 2 \times 3 = 7$.**

*** When using trig functions, always check the Deg/Rad pushbutton for the correct units.**

Done
▼

Appendix A: Built In Functions and Conversions

The 22 math functions are listed first, in no particular order, followed by a non-functioning separator line " ==convert from:to== ", and then the 269 unit conversion functions listed in alphabetical order.

Function:	Description:		
x ²	x squared	cu in:cu yd	cubic inches to cubic yards
x ³	x cubed	cu m:cu ft	cubic meters to cubic feet
1/x	reciprocal of x	cu m:cu in	cubic meters to cubic inches
x!	x factorial	cu m:cu yd	cubic meters to cubic yards
sqrt x	square root of x	cu yd:cu ft	cubic yards to cubic feet
cube root x	cube root of x	cu yd:cu in	cubic yards to cubic inches
Exp	Exponential	cu yd:cu m	cubic yards to cubic meters
ln	natural log	cup Imp:cup US	cups (Imperial) to cups (US)
log	log(base 10), or Common Log	cup Imp:fl oz Imp	cups (Imperial) to fluid ounces (Imperial)
pi	value of pi	cup Imp:gal Imp	cups (Imperial) to gallons (Imperial)
cos	cosine	cup Imp:l	cups (Imperial) to litres
sin	sine	cup Imp:pt Imp	cups (Imperial) to pints (Imperial)
tan	tangent	cup Imp:qt Imp	cups (Imperial) to quarts (Imperial)
acos	arccosine, or inverse cosine	cup Imp:Tbsp Imp	cups (Imperial) to Tablespoons (Imperial)
asin	arcsine, or inverse sine	cup US:cup Imp	cups (US) to cups (Imperial)
atan	arctangent, or inverse tangent	cup US:gal US	cups (US) to gallons (US)
cosh	hyperbolic cosine	cup US:l	cups (US) to litres
sinh	hyperbolic sine	deg C:deg F	degrees Celsius to degrees Fahrenheit
tanh	hyperbolic tangent	deg F:deg C	degrees Fahrenheit to degrees Celsius
acosh	hyperbolic arccosine	deg:radian	degrees to radians
asinh	hyperbolic arcsine	fl oz Imp:cup Imp	fluid ounces (Imperial) to cups (Imperial)
atanh	hyperbolic arctangent	fl oz Imp:fl oz US	fluid ounces (Imperial) to fluid ounces (US)
== convert from:to ===	non-functioning list separator, illustrating format of conversion abbreviations listed below:	fl oz Imp:gal Imp	fluid ounces (Imperial) to gallons (Imperial)
acre:hect	acres to hectares	fl oz Imp:l	fluid ounces (Imperial) to liters
acre:sq ft	acres to square feet	fl oz Imp:ml	fluid ounces (Imperial) to milliliters
acre:sq km	acres to square kilometers	fl oz Imp:pt Imp	fluid ounces (Imperial) to pints (Imperial)
acre:sq yd	acres to square yards	fl oz Imp:qt Imp	fluid ounces (Imperial) to quarts (Imperial)
acre:sq m	acres to square meters	fl oz US:cup US	fluid ounces (US) to cups (US)
acre:sq mi	acres to square miles	fl oz US:fl oz Imp	fluid ounces (US) to fluid ounces (Imperial)
atm:bar	atmosphere to bar	fl oz US:gal US	fluid ounces (US) to gallons (US)
atm:PSI	atmosphere to pounds/square inch	fl oz US:l	fluid ounces (US) to liters
atm:in Hg	atmosphere to inches of Mercury (30 deg C)	fl oz US:pt US	fluid ounces (US) to pints (US)
atm:kPa	atmosphere to kiloPascal	fl oz US:qt US	fluid ounces (US) to quarts (US)
bar:atm	bar to atmosphere	ft:cm	feet to centimeters
bar:in HG	bar to inches of Mercury (30 deg C)	ft:in	feet to inches
bar:kPa	bar to kiloPascals	ft:km	feet to kilometers
bar:PSI	bar to pounds/square inch	ft:m	feet to meters
bit:byte	bits to bytes (computer)	ft:mi	feet to miles
BTU:kJ	British Thermal Units to kiloJoules	ft:yd	feet to yards
BTU/hr:hp	British Thermal Units/hour to horsepower	ft lb:J	foot pounds to Joules
BTU/hr:kw	British Thermal Units/hr to kilowatts	ft lb:Nm	foot pounds to Newton-meters
BTU/hr:ft lb/sec	British Thermal Units to foot-pounds/second	ft lb/sec:BTU/hr	foot pounds/second to British Thermal Units/hour
byte:bit	bytes to bits (computer)	ft lb/sec:hp	foot pounds/second to horsepower
cal:J	calories to Joules	ft lb/sec:kw	foot pounds/second to kilowatts
cm:in	centimeters to inches	ft/min:fps	feet/minute to feet/second
cm:ft	centimeters to feet	ft/min:mph	feet/minute to miles/hour
cm:yd	centimeters to yards	fps:ft/min	feet/second to feet/minute
cm:m	centimeters to meters	fps:kph	feet /second to kilometers/hour
cu ft:cu in	cubic feet to cubic inches	fps:mph	feet/second to miles/hour
cu ft:cu m	cubic feet to cubic meters	fps:m/sec	feet/second to meters/second
cu ft:cu yd	cubic feet to cubic yards	g:kg	grams to kilograms
cu in:cu ft	cubic inches to cubic feet	g:lb	grams to pounds
cu in:cu m	cubic inches to cubic meters	g:oz	grams to ounces

gal Imp:fl oz Imp	gallons (Imperial) to fluid ounces (Imperial)
gal Imp:l	gallons (Imperial) to liters
gal Imp:pt Imp	gallons (Imperial) to pints (Imperial)
gal Imp:qt Imp	gallons (Imperial) to quarts (Imperial)
gal Imp:gal US	gallons (Imperial) to gallons (US)
gal US:fl oz US	gallons (US) to fluid ounces (US)
gal US:gal Imp	gallons (US) to gallons (Imperial)
gal US:l	gallons (US) to liters
gal US:pt US	gallons (US) to pints (US)
gal US:qt US	gallons (US) to quarts (US)
hect:acre	hectares to acres
hect:sq km	hectares to square miles
hour:min	hours to minutes
hour:sec	hours to seconds
hp:BTU/hr	horsepower to British Thermal Units/hour
hp:kw	horsepower to kilowatts
hp:ft lb/sec	horsepower to foot pounds/second
in:cm	inches to centimeters
in:ft	inches to feet
in:km	inches to kilometers
in:m	inches to meters
in:mi	inches to miles
in:mm	inches to millimeters
in:pica	inches to picas (printing)
in:yd	inches to yards
in Hg:atm	inches of Mercury (30 deg C) to atmosphere
in Hg:bar	inches of Mercury (30 deg C) to bar
in Hg:kPa	inches of Mercury (30 deg C) to kiloPascals
in Hg:PSI	inches of Mercury (30 deg C) to pounds/square inch
in lb:Nm	inch pounds to Newton meters
J:cal	Joules to calories
J:ft lb	Joules to foot pounds
kg:g	kilograms to grams
kg:lb	kilograms to pounds
kg:oz	kilograms to ounces
kJ:BTU	kiloJoules to British Thermal Units
km:in	kilometers to inches
km:ft	kilometers to feet
km:mi	kilometers to miles
km:m	kilometers to meters
km:yd	kilometers to yards
kPa:atm	kiloPascals to atmosphere
kPa:in Hg	kiloPascals to inches of Mercury (30 deg C)
kPa:lb/sq ft	kiloPascals to pounds/square feet
kPa:PSI	kiloPascals to pounds/ square inch
kph:fps	kilometers/ hour to feet/second
kph:mph	kilometers/ hour to miles/hour
kph:m/sec	kilometers/ hour to meters/second
kt:nm/hr	knots to nautical miles/hour
kt:mph	knots to miles/hour (statute)
kw:BTU/hr	kilowatts to British Thermal Units/hour
kw:hp	kilowatts to horsepower
kw:ft lb/sec	kilowatts to foot pounds/second
l:fl oz Imp	liters to fluid ounces (Imperial)
l:fl oz US	liters to fluid ounces (US)
l:gal Imp	liters to gallons (Imperial)
l:gal US	liters to gallons (US)
l:pt Imp	liters to pints (Imperial)
l:qt Imp	liters to quarts (Imperial)
l:qt US	liters to quarts (US)
l/100km:mi/gal Imp	liters/100 kilometers to miles/gallon (Imperial)

l/100km:mi/gal US	liters/100 kilometers to miles/gallon (US)
lb:g	pounds to grams
lb:kg	pounds to kilograms
lb:oz	pounds to ounces
lb:ton	pounds to tons
lb/sq ft:kPa	pounds/square foot to kiloPascals
lb/sq ft:PSI	pounds/square foot to pounds/square inch
m:cm	meters to centimeters
m:ft	meters to feet
m:in	meters to inches
m:km	meters to kilometers
m:mi	meters to miles
m:yd	meters to yards
m/sec:fps	meters/second to feet/second
m/sec:kph	meters/second to kilometers/hour
m/sec:mph	meters/second to miles/hour
mi:in	miles to inches
mi:ft	miles to feet
mi:km	miles to kilometers
mi:m	miles to meters
mi:nm	miles (statute) to nautical miles
mi:yd	miles to yards
mi/gal Imp:l/100km	miles/gallon (Imperial) to liters/100 kilometer
mi/gal Imp:mi/gal US	miles/gallon (Imperial) to miles/gallon (US)
mi/gal US:l/100km	miles/gallon (US) to liters/100 kilometers
mi/gal US:mi/gal Imp	miles/gallon (US) to miles/gallon (Imperial)
ml:fl oz Imp	milliliters to fluid ounces (Imperial)
min:hr	minutes to hours
min:sec	minutes to seconds
mm:in	millimeters to inches
mph:fps	miles/hour to feet/second
mph:ft/min	miles/hour to feet/minute
mph:kt	miles/hour to knots
mph:kph	miles/hour to kilometers/hour
mph:m/sec	miles/hour to meters/second
m/sec:fps	meters/second to feet/second
nm:mi	nautical miles to miles (statute)
Nm:ft lb	Newton meters to foot pounds
Nm:in lb	Newton meters to inch pounds
oz:g	ounces to grams
oz:kg	ounces to kilograms
oz:lb	ounces to pounds
pica:in	picas to inches (printing)
pica:pts	picas to points (printing)
pt Imp:gal Imp	pints (Imperial) to gallons (Imperial)
pt Imp:qt Imp	pints (Imperial) to quarts (Imperial)
pt Imp:cup Imp	pints (Imperial) to cups (Imperial)
pt Imp:fl oz Imp	pints (Imperial) to fluid ounces (Imperial)
pt Imp:l	pints (Imperial) to liters
pt Imp:pt US	pints (Imperial) to pints (US)
pt US:fl oz US	pints (US) to fluid ounces (US)
pt US:gal US	pints (US) to gallons (US)
pt US:pt Imp	pints (US) to pints (Imperial)
pt US:qt US	pints (US) to quarts (US)
pts:pica	points to picas (printing)
PSI:atm	pounds/square inch to atmosphere
PSI:Bar	pounds/square inch to bar
PSI:in Hg	pounds/square inch to inches of Mercury (30 deg C)
PSI:kPa	pounds/square inch to kiloPascals
PSI:lb/sq ft	pounds/square inch to pounds/square foot
qt Imp:gal Imp	quarts (Imperial) to gallons (Imperial)

qt Imp:pt Imp	quarts (Imperial) to pints (Imperial)
qt Imp:cup Imp	quarts (Imperial) to cups (Imperial)
qt Imp:fl oz Imp	quarts (Imperial) to fluid ounces (Imperial)
qt Imp:l	quarts (Imperial) to liters
qt Imp:qt US	quarts (Imperial) to quarts (US)
qt US:fl oz US	quarts (US) to fluid ounces (US)
qt US:gal US	quarts (US) to gallons (US)
qt US:l	quarts (US) to liters
qt US:pt US	quarts (US) to pints (US)
qt US:qt Imp	quarts (US) to quarts (Imperial)
radian:deg	radians to degrees
sec:hr	seconds to hours
sec:min	seconds to minutes
sq cm:sq in	square centimeters to square inches
sq cm:sq ft	square centimeters to square feet
sq cm:sq m	square centimeters to square meters
sq cm:sq yd	square centimeters to square yards
sq ft:acre	square feet to acres
sq ft:sq cm	square feet to square centimeters
sq ft:sq in	square feet to square inches
sq ft:sq m	square feet to square meters
sq ft:sq yd	square feet to square yards
sq in:sq cm	square inches to square centimeters
sq in:sq ft	square inches to square feet
sq in:sq m	square inches to square meters
sq in:sq yd	square inches to square yards
sq km:acre	square kilometers to acres
sq km:hect	square kilometers to hectares
sq km:sq mi	square kilometers to square miles
sq m:acre	square meters to acres
sq m:sq cm	square meters to square centimeters
sq m:sq in	square meters to square inches
sq m:sq ft	square meters to square feet
sq m:sq yd	square meters to square yards
sq mi:acre	square miles to acres
sq m:sq km	square miles to square kilometers

sq yd:acre	square yards to acres
sq yd:sq cm	square yards to square centimeters
sq yd:sq in	square yards to square inches
sq yd:sq ft	square yards to square feet
sq yd:sq m	square yards to square meters
tsp Imp:fl oz Imp	teaspoons (Imperial) to fluid ounces (Imperial)
tsp Imp:fl oz US	teaspoons (Imperial) to fluid ounces (US)
tsp Imp:Tbsp Imp	teaspoons (Imperial) to Tablespoons (Imperial)
tsp Imp:Tbsp US	teaspoons (Imperial) to Tablespoons (US)
tsp Imp:tsp US	teaspoons (Imperial) to
tsp US:fl oz Imp	teaspoons (US) to fluid ounces (Imperial)
tsp US:fl oz US	teaspoons (US) to fluid ounces (US)
tsp US:Tbsp Imp	teaspoons (US) to Tablespoons (Imperial)
tsp US:Tbsp US	teaspoons (US) to Tablespoons (US)
tsp US:tsp Imp	teaspoons (US) to teaspoons (Imperial)
Tbsp Imp:cup Imp	Tablespoons (Imperial) to cups (Imperial)
Tbsp Imp:Tbsp US	Tablespoons (Imperial) to Tablespoons (US)
Tbsp Imp:tsp Imp	Tablespoons (Imperial) to teaspoons (Imperial)
Tbsp US:cup US	Tablespoons (US) to cups (US)
Tbsp US:tsp Imp	Tablespoons (US) to teaspoons (Imperial)
Tbsp US:tsp US	Tablespoons (US) to teaspoons (US)
ton:lb	tons to pounds
yd:cm	yards to centimeters
yd:ft	yards to feet
yd:in	yards to inches
yd:km	yards to kilometers
yd:m	yards to meters
yd:mi	yards to miles