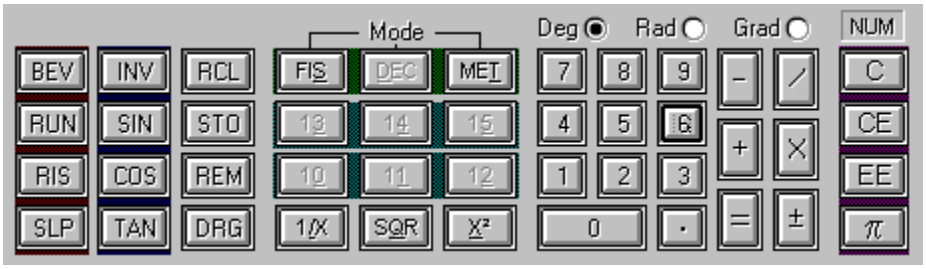
Table of Contents

Formula Categories

- **Formulas for solving Right Triangle**
- **Formulas for solving Qblique Triangle**
- **Formulas for plane figures**
- **Formulas for shaped figures**


Main Display Area #1
Display block #1-1
Display block #1-2
Main Display Area #2
Display block #2-1
Display block #2-2
Indicates input display

Click a Calculator Key for the keyboard equivalent

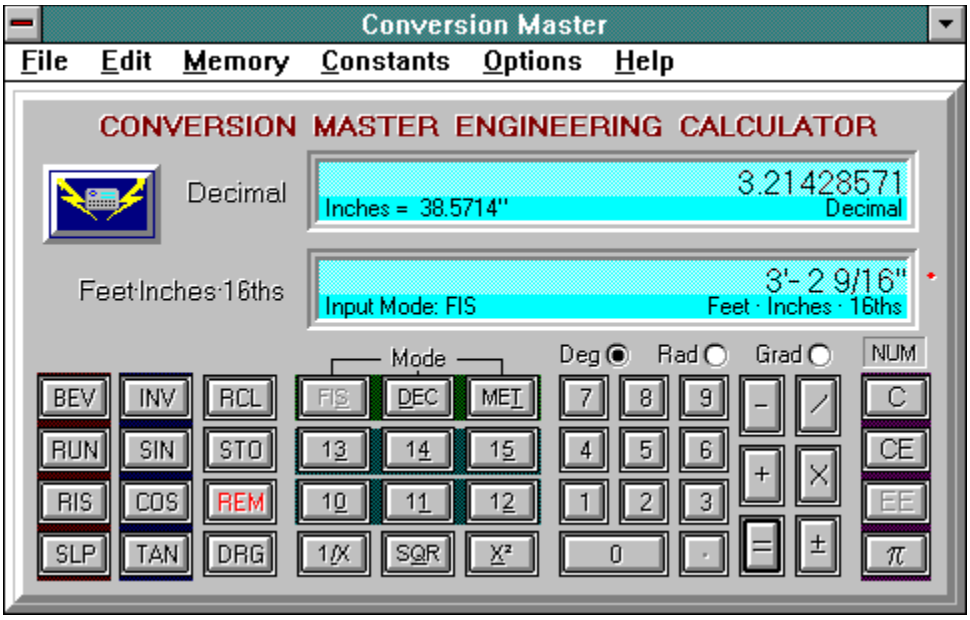


- **View all**

Notes:

- To access the keyboard's Numeric Keypad, the Num Lock key must be activated.
- Optionally, the extended numeric keys 10-15 can be entered via the keypad. With Num Lock key activated, use the Alt key in conjunction with numeric digits 0-5 to enter them.
- The Deg, Rad & Grad option buttons can be changed by using the Page Up or Page Down keys.
- Note, that in the FIS mode the decimal point and exponent key is disabled and in the DEC & MET modes the 10-15 keys are disabled. When disabled, these keys will appear grayed and will be inaccessible.
- **Calculator Keys Described** (Click Calculator Icon)

Click the part of the Calculator Window you want to know more about.



- **See Keyboard Interface**.

Index to General Information

Index to Menu Descriptions

Shift F1

Shift F2

Shift F3

Shift F4

Shift F5

Shift F6

Shift F7

Shift F8

Shift F9

Shift F10

Shift F11

Shift F12

Alt S

Alt D

Alt T

Alt 0

Alt 1

Alt 2

Alt 3

Alt 4

Alt 5

Alt + or Alt -

Alt Q

Alt X

Alt P

Key accessed via Numeric key pad. See notes below.

PageUp or PageDown key

Home key

End key

Insert key

Alt /

Num Lock key

Calculator Keys	Keyboard Equivilents
BEV	Shift F1
RUN	Shift F2
RIS	Shift F3
SLP	Shift F4
INV	Shift F5
SIN	Shift F6
COS	Shift F7
TAN	Shift F8
RCL	Shift F9
STO	Shift F10
REM	Shift F11
DRG	Shift F12
FIS	Alt S
DEC	Alt D
MET	Alt T
10	Alt 0
11	Alt 1
12	Alt 2
13	Alt 3
14	Alt 4
15	Alt 5
1/X	Alt /
SQR	Alt Q
X²	Alt X
0-9 & **+, -, ×, ÷, =**	Numeric key pad
±	Alt + OR Alt -
C	Home
CE	End
EE	Insert
	Alt P

The **FIS** Key allows input in Feet, Inches and Sixteenths format. In this mode the Extended Numeric Keys are activated. Calculations performed in this mode will be displayed in their lowest terms (i.e. 1' - 6 8/16" will become 1' - 6 1/2" etc...) with the exception of main display area two, which will always display Feet, Inches and Sixteenths in the FIS mode. When switching between modes FIS, DEC & MET, the display and the Memory pull down menu values will automatically convert to the new mode format while the Constant pull down menu values will remain the same. Upon exiting Conversion Master, the last mode change can be retained when initialization file is updated.

The **MET** mode treats all input as Meters. In this mode the Extended Numeric Keys are deactivated. When switching between modes FIS, DEC & MET the display and the Memory pull down menu values will automatically convert to the new mode format while the Constant pull down menu values will remain the same. Upon exiting Conversion Master, the last mode change can be retained when initialization file is updated.

The **DEC** key treats all input as feet. In this mode the Extended Numeric Keys are deactivated. When switching between modes FIS, DEC & MET the display and the Memory pull down menu values will automatically convert to the new mode format while the Constant pull down menu values will remain the same. Upon exiting Conversion Master, the last mode change can be retained when initialization file is updated.

The **Extended Numeric Keys** (10-15) allow for input values of 10 & 11 when inputting

inches and values 10-15 when inputting sixteenths in the FIS mode. When inputting inches and sixteenths, always use a single key stroke. The extended numeric keys are deactivated in the DEC and MET modes.
When performing division in the FIS mode there may be a remainder or an overage because the calculator will round to the nearest Specified Fractional Accuracy. A positive value signifies a remainder and a negative value denotes an overage. This value can be determined by the **REM** key. In order to alert the user the **REM** key will be highlighted in red when a remainder or an overage occurs. Also See **Options Menu** to set display accuracy.
The **RCL** & **STO** keys allow you to store and recall up to 9 memory locations. These areas are accessed by selecting either the **RCL** key or the **STO** key and a numeric key of 1 to 9. These memory locations can optionally be accessed from the memory pull down menu on the menu bar. Also, the **RCL** key can be used to recall the last entered BEV, RUN, RIS and SLP values.
The **BEV** key is used to enter the bevel of an acute angle of a right triangle. The bevel can be further defined as the amount of rise in inches over one foot (i.e. the pitch on a roof) or the tangent of the angle. The Bevel/Tangent can be calculated when any two sides of a right triangle are known Run/Side Adjacent, Rise/Side Opposite or Slope/Hypotenuse. The Bevel can be entered as a FIS, DEC or MET number. When the bevel and any other side of the right triangle are known the INV BEV key combination can be used to simultaneously display the Bevel, Run, Rise, Slope and the Angle in degrees, minutes and seconds. A conversion can be performed at any point by pressing FIS, DEC or MET key for the desired mode change. See BEV, RUN, RIS and SLP key overview.
The **RUN** key is used to enter the amount of run of a right triangle. This value can be entered in all three modes. See BEV, RUN, RIS and SLP key overview.
The **RIS** key is used to enter the amount of rise of a right triangle. This value can be entered in all three modes. See BEV, RUN, RIS and SLP key overview.
The **SLP** key is used to enter the amount of Slope or the Hypotenuse of a right triangle. This value can be entered in all three modes. See BEV, RUN, RIS and SLP key overview.
The BEV, RUN, RIS and SLP keys are used to solve right triangles. Upon entering any two values, the calculator solves for the remaining sides. The Calculator uses the last two input values (Bevel, Run, Rise or Slope) to solve the triangle. You can force the calculator to view the Bevel, Run, Rise or Slope as its last input by pressing the RCL and then BEV, RUN, RIS or SLP key. This is useful when one of these stored values are needed to solve another triangle. This key combination will put the selected value in the calculator's main display. When the any two values are known the INV BEV key combination can be used to simultaneously display the Bevel, Run, Rise, Slope and the Angle in degrees, minutes and seconds.
The **DRG** key changes the calculator angle mode to Degrees, Radians or Grads without doing a conversion on the displayed value. See also Degree, Radian & Gradian Option buttons.
The **Deg, Rad and Grad Option buttons** change the calculator angle mode to Degrees, Radians or Grads and perform a conversion on the displayed value. See also DRG key.
The **SIN COS & TAN** keys calculate the Sine, Cosine or Tangent of the displayed value. The Calculator will also simultaneously display the Arc Sine, Arc Cosine or Arc Tangent of the angle along with the angle in Decimal of Degrees, Degrees·Minutes·Seconds format, Radians and Grads. See also INV & DRG keys.
The **INV** key is used in conjunction with SIN COS & TAN keys to calculate the smallest relative angle of the displayed value i.e. Arc Sine, Arc Cosine and Arc Tangent. The Calculator will also simultaneously display the Sine, Cosine or Tangent of the relative angle along with the angle in Decimal of Degrees, Degrees·Minutes·Seconds format, Radians and Grads. Optionally the **INV** key can be used with the BEV key to display the stored Bevel, Run, Rise Slope and Angle. See Also DRG key.
The **1/X** Reciprocal key divides the displayed value of the Calculator X into 1.
The **SQR** key calculates the Square Root of the displayed value. See also **X²** key.

The **X²** key Squares (X**x**X) the displayed value. See also **SQR** key.
The **Standard Numeric Keys** input calculator digits 0 - 9. See also Extended Numeric Keys.
The **Decimal Point** key allows for inputting decimals of feet. This key is deactivated when the calculator is in the FIS mode.
The Operator keys perform the various arithmetic functions (**+, -, ×, ÷, =, ±**).

The key displays the value of Pi truncated to 11 digits (3.14159265359).
This value can and will be further truncated based on the setting of the decimal accuracy.
See **Options menu** for the setting of caluclator accuracys.
The **Cancel Key** cancels all pending Calculator operations and sets the calculator displays to zero. Clicking this key twice in succession will clear the values that were stored by using BEV, RUN, RIS or SLP keys. See also Cancel Entry Key.
The **Cancel Entry Key** cancels numeric entries and sets the calculator displays to zero.
See also Cancel Key.
The **Enter Exponent Key** raises the value of the main calculator display to power where

 is the value enter after the **EE** key is pressed. This key is disabled in the FIS mode.

Shows the active state of the NumLock key. The NumLocks must be on to use the Keyboard Interface.

Display #1

- In FIS mode displays Feet and Inches in decimal format
- In DEC mode displays feet in decimal format.
- In MET mode displays Meters in decimal format.
- This is the active input display in the DEC & MET modes.
- When a Trig function key is pressed the calculator displays the Angle in decimal, (Arc)sine, (Arc)cosine & (Arc)tangent information in display area number one.
- This display will also alternate Trigonometric information based on which option button is selected.
  See Degrees, Radians, or Grads.
- When a BEV, RUN, RIS or SLP key is pressed the calculator displays Bevel, Run, Rise and Slope information in both display areas.
- Display Blocks

Display blocks' 1-1 & 2-1 are limited to 26 characters, Display area #2 is limited to 31 characters. Upon occasion, when working with very large numbers, you may receive a **display overflow** message. If this occurs you can view the value by forcing it to the main display. This can be achieved by switching Calculator modes or when dealing with Bevel, Run, Rise, Slop functions, by clicking the RCL key in conjuction with the desired function key.

Display #2

- In FIS mode displays Feet, Inches & 16ths format i.e. 12' - 4 13/16".
- In DEC mode displays Feet, Inches 16ths & decimal of inches formats.
- In MET mode displays Feet, Inches 16ths & millimeters.
- This is the active input display in the FIS mode.
- When a Trig function key is pressed the calculator displays Radians, Grads·and Degrees·Minutes·Seconds (45°·15'·13") data in display area number two.
- When a BEV, RUN, RIS or SLP key is pressed the calculator displays Bevel, Run, Rise and Slope information in both display areas.
- This display area can be deactivated/hidden from view (See **Options**) in the DEC and MET modes. If deactivated, it will automatically reactivate when switching to the FIS mode or when using the BEV, RUN, RIS and SLP functions.
- Display Blocks

Display blocks' 1-1 & 2-1 are limited to 26 characters, Display area #2 is limited to 31 characters. Upon occasion, when working with very large numbers, you may receive a **display overflow** message. If this occurs you can view the value by forcing it to the main display. This can be achieved by switching Calculator modes or when dealing with Bevel, Run, Rise, Slop functions, by clicking the RCL key in conjuction with the desired function key.

WEIGHTS

Avoirdupois weight - abv. (avdp.) An English and American system of weights in which:

ton	= 2000 pounds
pound	= 16 ounces
ounce	= 16 drams

Apothecaries' weight - abv. (apoth.) System of weight used chiefly by Pharmacists in which:

scruple	= 20 grains
dram	= 3 scruples
ounce	= 8 drams
pound	= 12 ounces

Troy weight - Systems weights for gold, silver, gem, etc... in which:

Pennyweight	= 24 grains
ounce	= 20 pennyweights
pound	= 12 Ounces
pound	= 480 grams

MEASURES

Apothecaries' measure - abv. (apoth.) System of measures used chiefly by Pharmacists in which:

fluid dram	= 60 minims
fluid ounce	= 8 fluid drams
pint	= 16 fluid ounces
gallon	= 8 pints

Common Conversion Abbreviations

IST. - International Steam Table
Int. - International measurement
Brit. - British measurement
US. - United States measurement
MKS - Meters, Kilograms, Seconds
CGS - Centimeters, Grams, Seconds
SI - International System of Units

Length and Distance

Statue mile - A unit of linear measure used in the U.S. and Great Britian, equal to about 5,280 feet
Nautical mile - A unit of linear measure for ships and aircraft, equal to 6,076 feet. Also, called the geographical mile.

Time Defintions

Calender year - The conventional calendar year of 365 days can be used in rough calculations only; the modern calendar is based on the Gregorian year of 365.2425 mean solar days, the value chosen by Pope Gregory XIII in 1582. This value requires that a leap-year day be introduced every four years as February 29, except that centennial years (1900, 2000, etc...) are leap years only when divisible by 400. The remaining difference between the Gregorian year (See tropical year below) and the tropical year introduces an error of 1 day in 3300 years.
Sidereal year - The sidereal year is the interval in which the earth completes one revolution in its orbit around the sun measured with respect to the fixed stars.
Tropical year - The tropical year is the interval between successive vernal equinoxes and has been defined by the International Astronomical Union for noon of January 1, 1900 as 31,556,925.9747 seconds = 365.24219879 mean solar days. The tropical year decreases by approximately 5.3 milliseconds per year.
Lunar month - The interval from one new moon to the next, equal to about 29.5 days.
Lunar year - A period of 12 lunar months.
Mean sun - A fictitious sun used for time keeping that moves uniformly along the celestial equator and maintains constant rate of apparent motion.
Mean solar time - Time that is based on the motion of the mean sun and that has the mean solar second as its unit -- called also *mean time***.**

Conversion Master Engineering Calculator
Version 2.01
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Index to Calculator Examples

All examples assume default accuracy settings

Basic Examples:

Using Conversion Tables:

Solving Oblique Triangles:

Solving Right Triangles:

Calculating Circular Segments:

Combination Triangles:

FIS KEY ENTRY

To enter 14' - 11 15/16".
14 feet, 11 and 15/16 inches.

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS 1 4 11 15	14' - 11 15/16"	# 2	*

To enter 11 /12/16".
11 and 12/16 Inches.

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS 11 12	11 12/16"	# 2	3/4 = 12 Sixteenths

To enter 11 /12/16".
11 and 12/16 Inches.

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS 11 12	11 12/16"	# 2	3/4 = 12 Sixteenths

To enter 17' - 0".

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS 1 7 0 0	17' - 0"	# 2	Press 0 twice to shift 17 to the feet position

*Notes:

- Use single key entries to enter Inches and Sixteenths.
- If you had entered the digits 1 & 5 for 15/16 you would have entered 1 inch and 5/16.

MULTIPLICATION BY WHOLE NUMBERS

What is the total linear length of 18 spaces equally spaced
4' - 7 7/8" apart?

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
4 7 14	4' - 7 14/16"	# 2	14/16" = 7/8"
X			
1 8 0 0	18' - 0"	# 2	18 as a whole number
=	83' 9 12/16"	# 2	length = 83' - 9 3/4"

MULTIPLICATION BY (FIS) NUMBERS

What is the square footage of a room that is 12' - 7 5/8" by 14' - 10 3/8".

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
1 2 7 10	12' - 7 10/16"	# 2	
X			
14 10 6	14' - 10 6/16"	# 2	
=	187.820204	# 1	Total area in (ft^2)

DIVISION BY WHOLE NUMBERS

If you have a length L = 64' - 0" and you want 15 equal spaces.
How far are the spaces apart (S = ?) and is there a remainder?

KEYS PRESSED	**DISPLAY RESULT**	**DISPLAY AREA**	**REMARKS**
FIS			
6 4 0 0	64' - 0"	# 2	' L '
/			
1 5 0 0	15' - 0"	# 2	15 as a whole number
=	4' - 3 3/16"	# 2	' S '
REM	3/16"	# 1	3/16" Remainder

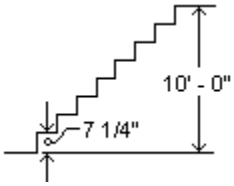
- See also, **Calculating stair risers example** for further explanation of the **REM** key

DIVISION BY (FIS) NUMBERS

You have added up a linear wall length of 178' - 10" and you want to calculate how many 2 x 4 studs it will take to build the wall on 16" centers.

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
1 7 8 10 0	178' - 10"	# 2	
/			
1 4 0	1' - 4"	# 2	1' - 4" = 16"
=	134.12500033	# 1	134.125 studs required

CALCULATING STAIR RISERS



The overall height of the stairs is 10' - 0". You want each stair riser to be 7 1/4" in height. How many risers are there?

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
1 0 0 0	10' - 0"	# 2	Overall height of stairs
STO 1	10' - 0"	# 2	Store height of stairs
/	10' - 0"	# 2	
7 4	7 4/16"	# 2	Desired height of risers
=	16.55172405	# 1	Number of risers required
RCL 1	10' - 0"	# 2	Recall height of stairs
/	10' - 0"	# 2	
1 7 0 0	17	# 1	Number of risers rounded 17 entered as whole #
=	7 1/16"	# 2	Height of each riser See *Note 1
REM	-1/16"	# 1-1	The neg. 1/16 indicates an overage See *Note 2

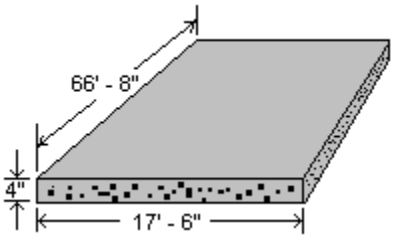
Notes:

1) After doing FIS division note the status of the REM key. It will be highlighted in red if an overage or a remainder has occurred. In this case, an overage.

2) The REM key informed us that an overage occurred since 7 1/16" X 17 = 10' - 0 1/16", hence an overage of 1/16".

3) Suppose you had desired risers of 7 11/16" each over a span of 9' - 0" you would have needed 14 risers. Dividing 14 into 9' - 0" would have produced a remainder of 3/8" since 7 11/16" X 14 = 8' - 11 5/8".

CALCULATING CUBIC YARDS
EXAMPLE # 1

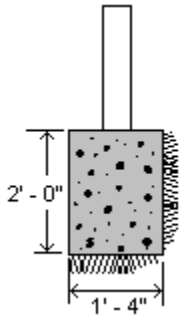


How may cubic yards of concrete are in a slab
17' - 6" Wide, 66' - 8" Long and 4" Thick?
There are 27 cubic feet in a cubic yard.

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
1 7 6 0	17' - 6"	# 2	Width
X	17' - 6"		
6 6 8 0	66' - 8"	# 2	Length
X	1166'- 8"	# 2	
4 0	4"	# 2	Thickness
=	388.88888502	# 1	Cubic feet
/	388.88888502	# 1	
DEC	388.88888502	# 1	change mode
2 7	27	# 1	*See Note below
=	14.40329204	# 1	Total cubic yards needed

Note:
There are 27 cubic feet in a cubic yard. Although this value was keyed in, it is simpler to let the Conversion Master remember your conversion constants for you. Conversion constants can be retained through the use conversion tables and called up at any point in time by Selecting Options and then Perform Conversion from the menu. Many commonly used conversions come with the Conversion Master, including this one.

CALCULATING CUBIC YARDS
EXAMPLE # 2



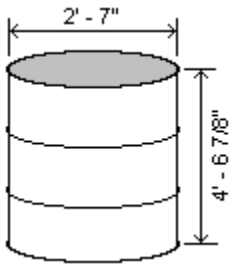
You have 175 linear feet of concrete footing to pour.
How may cubic yards of concrete are needed for this footing?
There are 27 cubic feet in a cubic yard.

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
2 0 0	2' - 0"	# 2	Height
X	2' - 0"	# 2	
1 4 0	1' - 4"	# 2	Width
X	2'- 8"	# 2	
1 7 5 0 0	175' - 0"	# 2	Linear feet
=	466.6666655	# 1	Cubic feet
/	466.6666655	# 1	
DEC	466.6666655	# 1	change mode
2 7	27	# 1	*See Note Below
=	17.28395057	# 1	Total cubic yards needed

Note:

There are 27 cubic feet in a cubic yard. Although this value was keyed in, it is simpler to let the Conversion Master remember your conversion constants for you. Conversion constants can be retained through the use of conversion tables and called up at any point in time by Selecting Options and then Perform Conversion from the menu. Many commonly used conversions come with the Conversion Master, including this one.

CALCULATING THE VOLUME OF A CYLINDER



Formulas:

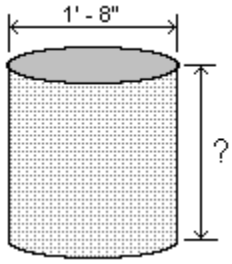
How many gallons of water will this barrel hold?

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
2 7 0	2' - 7"	# 2	Diameter
/	2' - 7"	# 2	
DEC	2' - 7"	# 1	
2	2	# 1	
=	1.29166666	# 1	Radius
X^2	1.66840276	# 1	Radius squared
X	1.66840276	# 1	
π	3.14159265	# 1	
X	5.24144185	# 1	Area of bottom
FIS	5.24144185	# 1	Area of bottom
X	5.24144185	# 1	Area of bottom
4 6 14	4' - 6 14/16"	# 2	Height of barrel
=	23.96867681	# 1	Total cubic feet

The Conversion Table category Volume and Capacity must be loaded before converting to gallons. From the calculator menu select **Options** > **Perform Conversion**. From the Conversion dialog select action to perform: **Cubic feet to Gallons (U.S., liq.).** The result (179.29815427) will appear in the **Conversion Resultant** display. The resultant can be transferred to the calculator by use of the **Resultant To Display** button if desired.

Answer: The barrel will hold 179 gallons of water

USING VOLUMES TO CALCULATE
CYLINDER LENGTHS



Formulas:

A fuel tank is needed that will hold 55 gallons of diesel fuel. This fuel tank is to be made out of a cylinder 1' - 8" in diameter. What is the length in feet of fuel tank?

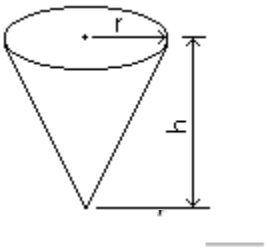
KEYS PRESSED	**DISPLAY RESULT**	**DISPLAY AREA**	**REMARKS**
DEC			
5 5	55	# 1	Gallons

Next, the Conversion Table category Volume and Capacity must be loaded before converting gallons to cubic feet. From the calculator menu select **Options** > **Perform Conversion**. From the Conversion dialog select action to perform: **Gallons (U.S., liq.) to Cubic feet.** The result (7.35224052) will appear in the **Conversion Resultant** display. Copy this result to the Clipboard by selecting **Edit** > **Copy Conversion Resultant.**

FIS			
1 8 0	1' - 8"	# 2	Diameter
/	1' - 8"	# 2	
DEC	1.66666667	# 1	
2	2	# 1	
=	.83333333	# 1	Radius
X^2	.69444444	# 1	Radius squared
X	.69444444	# 1	
π	3.14159265	# 1	
=	2.18166155	# 1	Area of bottom
STO 1	2.18166155	# 1	Store Area
Menu **Edit Paste**	7.35243052	# 1	Paste volume in cu/ft
/	7.35243052	# 1	Volume in cu/ft
RCL 1	2.18166155	# 1	Area of bottom
=	3.37010593	# 1	
FIS	3' - 4 7/16"	# 2	Length of cylinder

Answer: The cylinder will need to be 3' - 4 7/16" in length

FINDING THE VOLUME OF A CONE



Formula:

Given: r = 2 7/8"
h = 8"

Find the Volume V:
in Ounces of U.S. liquid
in Cubic inches
in Milliliters

Load Conversion Table category Volume and Capacity from the menu to solve this problem. Next, select perform conversions button. From the Conversion dialog select action to perform: **Cubic feet to Ounces (U.S., liq.).**

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS π	3.14159265	# 1	
X	3.14159265	# 1	
2 14	2 7/8"	# 2	Radius of the cone
X²	.05740017	# 1	Area of the top of the cone
X	.05740017	# 1	
8 0	8"	# 2	Height of the cone
=	.12021864	# 1	
/	.12021864	# 1	
DEC	.12021864	# 1	
3	3	# 1	
=	.04007288	# 1	Volume in cubic feet

The result (38.37004267) will appear in the **Conversion Resultant Display** of the Conversion dialog. Press Resultant to Display button to place this conversion in the calculator main display area.

	38.37004267	# 1	Volume in Ounces of U.S.,liq.

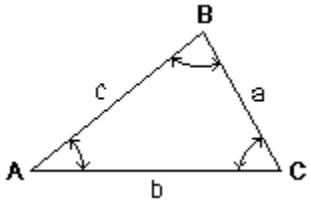
Next, select action to perform: **Ounces (U.S., fluid) to Cubic inches.**
The result (69.24593638) will appear in the **Conversion Resultant Display** of the Conversion dialog. Press Resultant to Display button to place this conversion in the calculator main display area.

69.24593638	# 1	Volume in cubic inches

Next, select action to perform: **Cubic inches to Milliliters.**
The result (1134.7375912) will appear in the **Conversion Resultant Display** of the Conversion dialog. Press Resultant to Display button to place this conversion in the calculator main display area.

1134.7375912	# 1	Volume in milliliters

SOLVING OBLIQUE TRIANGLES
EXAMPLE # 1



Given: a = 9' - 4 7/8"
b = 20' - 11 1/4"
c = 22" - 11 7/16"

Find angle **A**

KEYS PRESSED	**DISPLAY RESULT**	**DISPLAY AREA**	**REMARKS**
FIS	0	# 2	
9 4 14	9' - 4 14/16"	# 2	**a**
+	9' - 4 14/16"	# 2	
2 0 11 4	20' - 11 4/16"	# 2	**b**
+	30' -4 2/16"	# 2	
2 2 11 7	22' - 11 7/16"	# 2	**c**
=	53' - 3 9/16"	# 2	
/	53' - 3 9/16"	# 2	
DEC	53.296875	# 1	
2	2	# 1	
=	26.648437	# 1	**S** (solution)
STO 1	26.648437	# 1	
X^2	710.13922	# 1	**S^2**
-	710.13922	# 1	
RCL 1	26.648437	# 1	
X	26.648437	# 1	
FIS	26' - 7 13/16"	# 2	**S**
9 4 14	9' - 4 14/16"	# 2	**a**
=	459' - 5 12/16"	# 2	
/	459' - 5 12/16"	# 2	
2 0 11 4	20' - 11 4/16"	# 2	**b**
/	21' - 11 5/16"	# 2	
2 2 11 7	22' - 11 7/16"	# 2	**c**
DEC	22.953124	# 1	
=	.9560871	# 1	
SQR	.9777970	# 1	
INV COS	12.09621	# 1	
X 2 =	24.192432	# 1	Angle **a** in degrees
COS	24°·12'·33"	# 2	Deg.·Min.·Sec.

SOLVING OBLIQUE TRIANGLES
EXAMPLE # 2

Formula:

Given: b = 20' - 11 1/4"
c = 22' - 11 7/16"
A = 30°

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS	0	# 2	
2 0 11 4	20' - 11 4/16"	# 2	**b**
X^2	438.37890	# 1	
+	438.37890	# 1	
2 2 11 7	22' - 11 7/16"	# 2	**c**
X^2	526.84594	# 1	
-	965.22484	# 1	
DEC	965.22484	# 1	
2	2	# 1	
X	2	# 1	
FIS	2	# 1	
2 0 11 4	20' - 11 4/16"	# 2	**b**
X	41' - 10 8/16	# 2	
2 2 11 7	22' - 11 7/16"	# 2	**c**
X	961.1621	# 1	
DEC	961.1621	# 1	**A**
3 0	30	# 1	
COS	.8660254	# 1	
=	132.83402	# 1	
SQR	11.525364	# 1	
FIS	11' - 6 5/16"	# 1	**a**

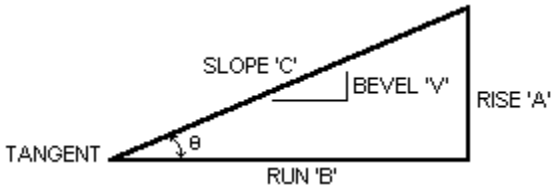
SOLVING OBLIQUE TRIANGLES
EXAMPLE # 3

Formula:

Given: a = 9' - 4 7/8"
A = 40°
B = 80°

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS	0	# 2	
9 4 14	9' - 4 14/16"	# 2	**a**
/	9' - 4 14/16"	# 2	
DEC	9.4062499	# 1	
4 0	40	# 1	Angle **A**
SIN	.6427875	# 1	
X	14.633527	# 1	
8 0	80	# 1	Angle **B**
SIN	.9848077	# 1	
=	14.411211	# 1	
FIS	14' - 4 15/16"	# 2	**b**

SOLVING RIGHT TRIANGLES
EXAMPLE # 1



Given: A = 4' - 8 7/16", C = 11' - 5 3/16"
Find: Bevel 'V'
Run 'A'
Convert Tangent to Degrees, Minutes & Seconds

KEYS PRESSED	**DISPLAY RESULT**	**DISPLAY AREA**	**REMARKS**
FIS			
4 8 7	4' - 8 7/16"	# 2	Rise
RIS	4' - 8 7/16"	# 2	Rise entered
1 1 5 3	11' - 5 3/16"	# 2	Slope
SLP	Slope = 11' - 5 3/16"	# 2	Slope entered
	Slope = 11.43229167	# 1	Slope in Dec. of feet
	Run = 10' - 5 1/16"	# 1-1	Run result **'A'**
	Bevel = 5 7/16"	# 1-2	Bevel result **'V'**
	Rise = 4' - 8 7/16"	# 2-1	Rise previous entry
INV BEV	Bevel = .45135243	# 1	Bevel result in dec. ft.
	Run = 10' - 5 1/16"	# 1-1	Run result
	Rise = 4' - 8 7/16"	# 1-2	Rise previous entry
	Slope = 11' - 5 3/16"	# 2-1	Slope previous entry
	Angle 24°·17'·32"	# 2	Angle result

SOLVING RIGHT TRIANGLES
EXAMPLE # 2

Given: V = 6 15/16", B = 21' - 11 15/16"
Find: Slope 'C'
Rise 'A'

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
6 15	6 15/16"	# 2	Bevel
BEV	6 15/16"	# 2	Bevel entered
2 1 11 15	21' - 11 15/16"	# 2	Run
RUN	Run = 21' - 11 15/16"	# 2	Run entered
	Run = 21.99479167	# 1	Run in Dec. of feet
	Rise = 12' - 8 9/16"	# 1-1	Rise result **'A'**
	Bevel = 6 15/16"	# 1-2	Bevel previous entry
	Slope = 25' - 4 7/8"	# 2-1	Slope result **'C'**

SOLVING RIGHT TRIANGLES
EXAMPLE # 3

Given: A = 12' 11 3/4", = 30°
Find: Bevel 'V', Run 'B' and Slope 'C'
Change A = 10' - 6" Recalculate Run and Slope

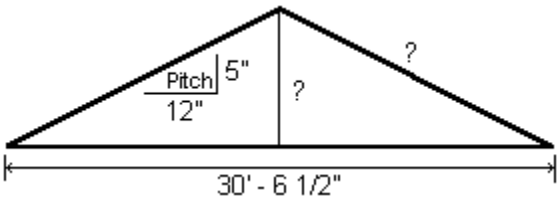
KEYS PRESSED	**DISPLAY RESULT**	**DISPLAY AREA**	**REMARKS**
DEC			
3 0	30	# 1	
TAN	.57735027	# 1	Angle Bevel **'V'** Result Bevel/Tangent of 30°
BEV	.57735027 6.92820324"	# 1 # 2	Bevel entered Bevel in dec. of inches
FIS	.57735027 6 15/16"	# 2	Bevel previous entry Bevel inches & 16ths
1 2 11 12	12' - 11 12/16" 12.97916667	# 2 # 1	Rise Rise in dec. of feet
RIS	Rise = 12.97916667 Run = 22' - 5 3/4" Bevel = 6 15/16" Rise = 12' - 8 9/16" Slope = 25' - 11 1/2"	# 1 # 1-1 # 1-2 # 2 # 2-1	Rise in dec. of feet Run result **'B'** Bevel previous entry Rise entered Slope result **'C'**
1 0 6 0	10' - 6" 10.5	# 2 # 1	New Rise
RIS	Rise = 10.5 Run = 18'- 2 1/4" Bevel = 6 15/16" Rise = 10' - 6" Slope = 21'- 0"	# 1 # 1-1 # 1-2 # 2 # 2-1	Rise in dec. of feet Run new result **'B'** Bevel previous entry New Rise entered Slope new result **'C'**

SOLVING RIGHT TRIANGLES
EXAMPLE # 4

Given: Run 'B' = 5.333 meters, Rise = 'A' = 3.667 meters
Find: Bevel 'V', and Slope 'C'
Find: Rise 'A' when Run 'B' = 1.750 meters
Convert all values to FIS

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
MET			Change to Meter mode
5 . 3 3 3	5.333	# 1	Run in Meters
	5333	# 2	Run in millimeters
RUN	5.333	# 1	Run entered
	5333	# 2	
3 . 6 6 7	3.667	# 1	Rise in Meters
	3667	# 2	Rise in millimeters
RIS	Rise = 3.667	# 1	Rise entered
	Run = 5.333	# 1-1	Run previous entry
	Bevel = 6876	# 1-2	Bevel result
	Rise = 3667	# 2	Rise in millimeters
	Slope = 6.4721	# 2-1	Slope result
RCL BEV	Bevel = .68760548	# 1	View bevel as last input
	Run = 5.333	# 1-1	bevel to be retained
	Rise = 3.667	# 1-2	new run to be entered
	Bevel = 687.60548	# 2	
	Slope = 6.4721	# 2-1	
1 . 7 5	1.75	# 1	Run in Meters
	17500	# 2	Run in millimeters
RUN	Run = 1.75	# 1	New run entered
	Rise = 1.2033	# 1-1	New rise result
	Bevel = 6876	# 1-2	Bevel previous entry
	Run = 1750	# 2	Run in millimeters
	Slope =2.1238	# 2-1	New slope result
FIS	Run = 5.74146982	# 1	Values convert to FIS
	Rise = 3' - 11 3/8"	# 1-1	
	Bevel = 8 1/4"	# 1-2	
	Run = 5' - 8 14/16"	# 2	
	Slope = 6' - 11 5/8"	# 2-1	

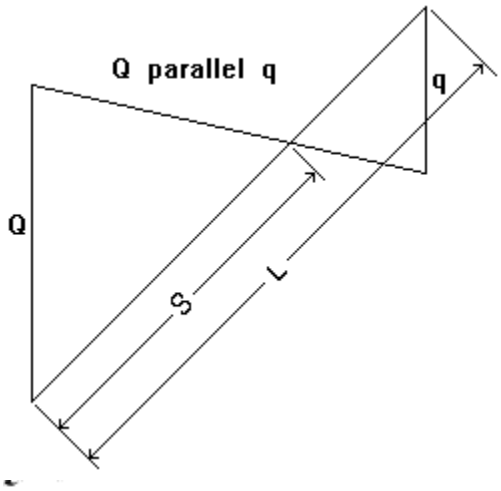
SOLVING RIGHT TRIANGLES
EXAMPLE # 5



Given: Half of overall span 15' - 3 1/4"
Find: Length of the ridge rafters (Slope) and total Rise and the angle of slope.

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS			
5 0	5"	# 2	Bevel\Pitch\ Tangent
BEV	5"	# 2	Bevel entered
1 5 3 4	15' - 3 4/16"	# 2	Run
RUN	Run = 15' - 3 4/16"	# 2	Run entered
INV BEV	Bevel = .41666667	# 1	Bevel result in dec. ft.
	Run = 15' - 3 1/4"	# 1-1	Run previous entry
	Rise = 6' - 4 3/8"	# 1-2	Rise result
	Slope = 16' - 6 1/2"	# 2-1	Slope result
	Angle 22°·37'·12"	# 2	Angle result

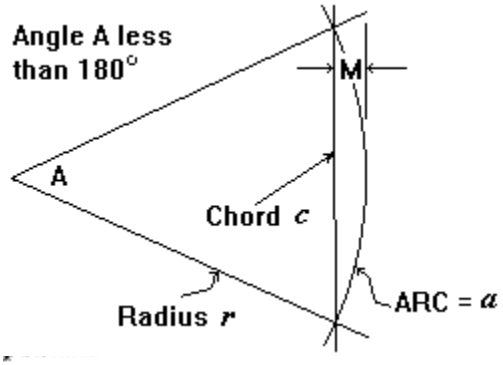
COMBINED TRIANGLES
EXAMPLE



Given: Q = 10' - 5 5/8", q = 4' - 8 7/16", L = 11' - 5 3/16"

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS	0	# 2	
10 5 10	10' - 5 5/8"	# 2	**Q**
STO 1	10' - 5 5/8"	# 2	
+	10' - 5 5/8"	# 2	
4 8 7	4' - 8 7/16"	# 2	**q**
=	15' - 2 1/16"	# 2	
STO 2	15' - 2 1/16"	# 2	
C	0	# 2	
RCL 1	10' - 5 5/8"	# 2	
/	10' - 5 5/8"	# 2	
RCL 2	15' - 2 1/16"	# 2	
X	8 4/16"	# 2	
1 1 5 3	11' - 5 3/16"	# 2	**L**
=	7' - 10 11/16"	# 2	**S**

CALCULATING CIRCULAR SEGMENTS
EXAMPLE # 1



r = 11' - 11 15/16', *A* = 30°

KEYS PRESSED	DISPLAY RESULT	DISPLAY AREA	REMARKS
FIS	0	# 2	
1 1 11 15	11' - 11 15/16"	# 2	RADIUS '***r*** '
STO 1	11' - 11 15/16"	# 2	
X	11' - 11 15/16"	# 2	
	3.14159265	# 1	
X	37.68274935	# 1	
DEC	37.68274935	# 1	
3 0	30	# 1	ANGLE ' **A** '
/	1130.48248046	# 1	
1 8 0	180	# 1	
=	6.28045822	# 1	
FIS	6' - 3 6/16"	# 2	ARC ' ***a*** ' = 6' - 3 3/8"
C	0	# 2	
DEC	0	# 2	
3 0	30	# 1	
/	30	# 1	
2	2	# 1	
=	15	# 1	**A** ÷ 2
SIN	.2588189	# 1	
X	.2588189	# 1	
RCL 1	11.99479167	# 1	RADIUS '***r*** '
=	3.10448058	# 1	
X	3.10448058	# 1	
2	2	# 1	
=	6.20896116	# 1	
FIS	6' - 2 8/16"	# 2	CHORD ' ***c*** ' = 6' - 2 8/16"
C	0	# 2	

DEC		0	# 2	
1	5	15	# 1	**A** ÷ 2
COS		.96592583	# 1	
±		-.96592583	# 1	
+		-.96592583	# 1	
1		1	# 1	
=		.03407417	# 1	
X		.03407417	# 1	
RCL	1	11.99479167	# 1	RADIUS '***r*** '
=		.40871257	# 1	
FIS		4 14/16"	# 2	**M** = 4 7/8"

Program Overview

THE CONVERSION MASTER ENGINEERING CALCULATOR
VERSION 2.01

Thank you for purchasing the Conversion Master Engineering Calculator, the most powerful dimensional and conversion calculator you will find for your computer. By far it is the most useful and versatile calculator you can own and at a price that any household can afford. The Conversion Master has a comprehensive help file system loaded with examples, how tos and explanations to get you up to speed quickly on its potential.

The Conversion Master has the ability to work with Meters, Decimals, Feet Inches Sixteenths, Degrees, Radians, Grads, Trig. functions, Bevels, Runs, Rises, Slopes and a multitude of user defined Conversions (self-constructed conversion tables). The Conversion Master comes equipped with over 3200 different conversions ready to access. The Conversion Master can convert between Decimal, Feet-Inches-Sixteenths and Meters at the click of a button!

Dimensional calculations can be performed without the need of charts or tables, thereby increasing accuracy and production. The Conversion Master also gives the user the ability to define his own conversion tables to accomplish almost every conversion imaginable.

The Conversion Master allows access to more information at one time than any other calculator through its use of Dual Displays which can utilize any of its six display blocks. For example, when working with Degrees, the Conversion Master will display Degrees-Minutes-Seconds, Decimal of Degrees, Radians and Grads all concurrently. In the Feet Inches Sixteenths input mode, the Conversion Master will continue giving the input value in Decimal of Feet, Decimal of Inches and Feet Inches Sixteenths in three of its display block areas. When solving right triangles the Conversion Master will simultaneously display the Bevel, Run, Rise, Slope and the angle in Degrees, Minutes and Seconds when any of two values are known.

Although the Conversion Master is designed as a dimensional calculator, it can also be used as a standard calculator. The second display can be hidden from view while working in the Meter and Decimal modes through the options menu. The second display will automatically reactivate when in the Feet Inches Sixteenths mode or when a right triangle is solved.

The Conversion Master has three basic input modes

- Feet-Inches-Sixteenths Mode (**FIS** key)
- Decimal Mode (**DEC** key)
- Metric Mode (**MET** key)

These modes can be switched at any time during or before entering operators or operands.

The Conversion Master has a uniquely designed key pad layout that makes dimensional calculations easy. Unlike a standard calculator the numeric keys are numbered from 0-15. The extended numeric keys (10-15) allow Inches and Sixteenths input with a single keystroke.

The Conversion Master Calculator will be extremely useful to anyone working in the Construction Industry.

Contractors - Engineers - Architects - Draftsmen - Detailers - Carpenters - Fitters - Fabricators - Surveyors and anyone linked to the Building and Construction Trades Industry .

The Conversion Master will save you time and money and prevent costly mistakes.

Release History

- **First Release** (Version 1.0 Beta/Evaluation Copy)

- **Second Release** (Version 1.1 Beta/Evaluation Copy)
  Improvements:
  Help file enhanced
  Conversions Categorized
  Over 2000 conversions added
  Feet, Inches and Sixteenths display added in MET mode

- **Third Release** (Version 2.0 Beta/Evaluation Copy)
  Fixes:
  Fixed some minor problems with the help file:
  *Help file was improperly called when the math category radio button was clicked and then the F1 key was pushed.
  *Some of the help file popups were not displayed properly.
  Fixed the problem of the Perform Conversions button on the Conversion Categories dialog. This button sometime would hide itself from view before the Perform Conversions dialog was activated.
  Improvements:
  Several useful formulas were put on-line in the help file system

- **Fourth Release** (Version 2.01 ShareWare Copy)
  Fixes:
  Fixed random problem with the reoccurring nag screen.
  Improvements:
  First Official release / Registration Made Available
  More help file enchancements

Looking forward

- Ideas for future releases (Give me yours)
  1000's more conversion
  History tape
  Parenthesis keys
  Formula scripts

Known Bugs and Limitations
Version 2.01

- I need your feedback on this one. If the program does not operate as described in the help file or if you think you have located a bug please contact me. Before contacting, take time to reproduce the problem and then document it.

- Although care was taken in creating the conversion tables that come with Conversion Master there is always a possibility of human error. In beta version 1.1 conversions were placed into categories to enable easier access. Please report any inconsistencies with regard to category placement and conversion inaccuracies.

- The maximum number of conversion table entries per category is 650.

Contact me directly at: Roger L. Moseby
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Owasso Ok. 74055

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Conversion Master Engineering Calculator
Version 2.01

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For more information call (918)-272-6684

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File Menu

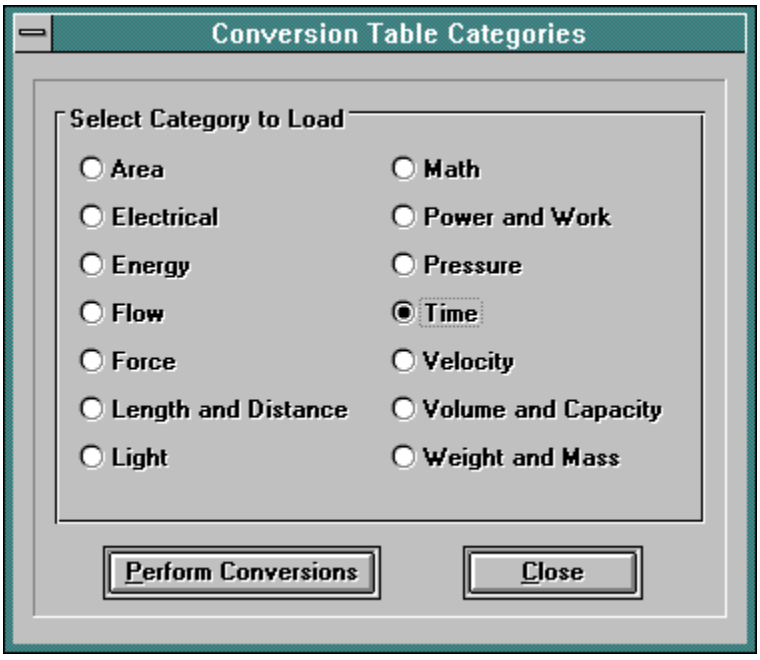
- **Dialogs invoked by**
- **Load Conversion Table**
- **Modify Conversion Table**
- **Exiting Conversion Master**

Conversion Table Category Dialogs

Both the Modify Conversion Table and the Load Conversion Table menu items will bring up a dialog box. The **Load Conversion Table** dialog is used to select a Conversion Table to load into memory from which conversions will be performed. Conversion Tables can be accessed in one of two ways. First, they can accessed by clicking the **Perform Conversion button** on the Load Conversion Table Dialog box. Secondly, they can be accessed through the Options Menu selection **Perform Conversions**. The Modify Conversion Table dialog will allow you to select a Conversion Table category to edit.

Load Conversion Table

Click the part of the Dialog Box you want to know more about.



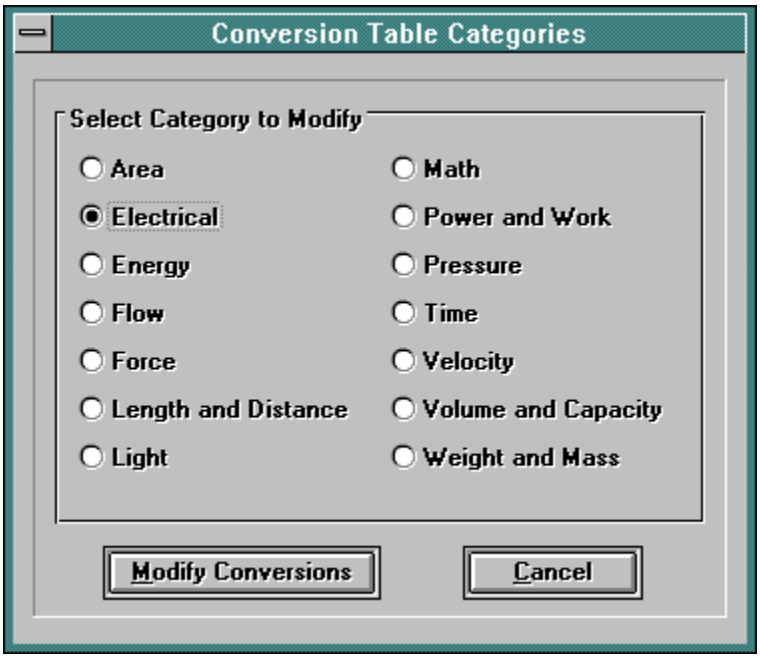
Selecting one of the option buttons merely loads the described category into memory.
See Performing Conversions and Modify Conversion Table
See also Common Conversion Abbreviations

Clicking this button dismisses this dialog box

Clicking this button invokes the Perform Conversion Dialog with the selected category loaded in memory. This button will not appear if the Perform Conversion Dialog is active.

Modify Conversion Table

Click the part of the Dialog Box you want to know more about.



See also Modifying Conversion Tables, Load Conversion Table

Common Conversion Abbreviations

Clicking this button opens the selected category for editing. If the Perform Conversion dialog is active you will be unable to edit any category other than the one loaded into memory. If any other category is selected for editing while performing conversions you will be prompted to close the perform conversion dialog box first.

Clicking this button cancels the pending operation and dismisses this dialog box

Area

This category contains conversion factors related to an area of land or the surface of an object which is measured in square units. These units result from multiplying the length of the area or object by its width. The square units of both the customary and metric systems are based on units of length and distance.

Sample of customary and metric units for area.

Customary	**Metric**	**Metric**	**Customary**
1 sq. mile	2.5899881 km²	1 sq. hectometer	2.4710538 acres
1 acre	0.40468564 ha	1 sq. dekameter	119.599001 sq. yd.
1 sq. rod	25.29285264 m²	1 sq. meter	1550.0031 sq. in.
1 sq. yard	0.83612736m²	1 sq. decimeter	15.500031 sq. in.
		1 sq. kilometer	0.38610216 sq. mi.
1 sq. foot	0.09290304 m²	1 sq. centimeter	0.15500031 sq. in.
1 sq. inch	6.4516 cm²	1 sq. millimeter	0.0015500031 sq. in.

Electrical
This category contains conversion factors related to the science or application of electricity.

Energy
This category contains conversion factors related to the capacity for doing work and overcoming resistance.
Units common to this category

1 Btu	= 1054.35 joule
1 Calorie	= 1000 cal
1 cal	= 4.1868 joule
1 erg	= 2.3892e-7cal
1 joule	= 1e7 erg

The **joule** (J) is the amount of energy needed to move a mass of one kilogram through one meter with an acceleration of one meter per second per second. The **erg** is the amount of energy needed to move one gram through one centimeter with an acceleration of one centimeter per second per second. The calorie (**cal**) is the amount of energy needed to raise the temperature of one gram of water by one degree Celsius from 14.5° Celsius to 15.5° Celsius. A **Calorie** is equal to 1000 **cals**. The British thermal unit (**Btu**) is the energy needed to raise the temperature of one pound of water from 60° Fahrenheit to 61° Fahrenheit.

Flow
This category contains conversion factors that relate to the quantity of a substance that flows in a certain period time (i.e. Cubic feet a second, etc....).

Force
This category contains conversion factors related to the energy being brought to bear against a mass causing motion or change.

Length and Distance

This category contains conversion factors that relate to lengths and distances. Lengths and distances are measured from one point to another, usually along a straight line. Length usually refers to the measurement of an object. Distance usually refers to the measurement of the space between two places.

Sample of customary and metric units for length and distance.

Customary	Metric	Metric	Customary
1 inch	2.54 cm	1 nanometer	0.00000003937 in.
1 foot	30.48 cm	1 micron	0.00003937in.
1 yard	0.9144 m	1 millimeter	0.03937 in.
1 rod	5.0292 m	1 centimeter	0.3937 in.
1 furlong	201.168 m	1 decimeter	3.3937 in.
1 mile	1.609344 km	1 meter	39.37 in.
		1 dekameter	393.7 in.
		1 hectometer	328.0833 ft.
		1 kilometer	0.62137 mi.

See category terms

Light
This category contains conversion factors related to the flow of light.

Math
This category contains conversion factors related to mathematics.

Power and Work

This category contains conversion factors related to work and power. **Power** is a measure of the amount of energy spent over a certain period of time. **Work** is the transference of energy from one body to another resulting in the motion or displacement of the body acted upon.

1 horsepower	= 745.7 watt
1 horsepower (metric)	= 735.499 watt
1 watt	= 0.00134102 horsepower
1 kilowatt	= 1000 watt

Pressure

This category contains conversion factors related to Pressure. In physics, pressure is force measured in terms of its distribution over an area of opposing force. This is expressed as force divided by unit area of the surface area to which the force is applied. Pressure usually refers to a force exerted uniformly in all directions. Absolute pressure is pressure measured with respect to zero pressure. Gauge pressure is pressure measured with respect to air pressure (the weight of one atmosphere).

Some of the common units are inches of mercury,(in of Hg) centimeters of mercury (cm of Hg), pounds per square inch (psi), atmospheres (atm), pascals (Pa), kilopascals (kPa), bars, millibars (mbars), and microbars (dynes).

1 atm = 14.69595 psi
= 29.92126 in. of mercury.
= 76 cm of mercury.
= 101.325 kPa
= 1013.25 mbars
1 Pa = 1 Newton per sq. meter
1 mbar = 1000 dynes per sq. cm

Time
This category contains conversion factors related to the measurement of time.

1 second	= 1000 milliseconds	1 solar year	= 365d, 5hr, 48min, 45.51sec
1 minute	= 60 seconds	1 astronomical year	= 365d, 5hr, 48min, 45.51sec
1 hour	= 60 minutes	1 sidereal year	= 366d, 6hr, 9min, 9sec
1 day	= 24 hours	1 lunar year	= 360d
1 week	= 7 days	1 leap year	= 366d
1 year	= 12 months		
1 century	= 100 years		
1 millennium	= 1000 years		

See category terms

Velocity
This category contains conversion factors related to the rate of movement in relationship to time.

Volume and Capacity

This category contains conversion factors related to volume and capacity. **Volume** refers to the amount of space occupied by an object. **Capacity** is the amount of a substance that a container can hold. **Volume** and **capacity** are both measured in cubic units. Cubic units combine length, width, and depth. The names of many common cubic units, such as liter and quart, do not include the word cubic.

Sample of customary and metric units for volume and capacity.

Customary	Metric	Metric	Customary
1 pint	473.1632 ml	1 kiloliter	264.1794 gal.
1 cubic inch	16.387064 cm^3	1 milliliter	0.06102545 cu. in.
1 cubic foot	0.028316847 m^3	1 centiliter	0.6102545 cu. in.
1 cubic yard	0.7646 m^3	1 liter	61.02545 cu. in.

Weight and Mass

This category contains conversion factors related to weight and mass. **Weight** is the heaviness or attraction of a material body by gravitational pull toward the center of the earth. **Mass** is the quantity of matter in a body as measured in its relation to inertia. The customary system measures the weight of various materials. The metric system measures mass (amount of material something contains). An object's mass does not change, but its weight decreases with altitude. These two measurement units are equal at sea level on the earth.

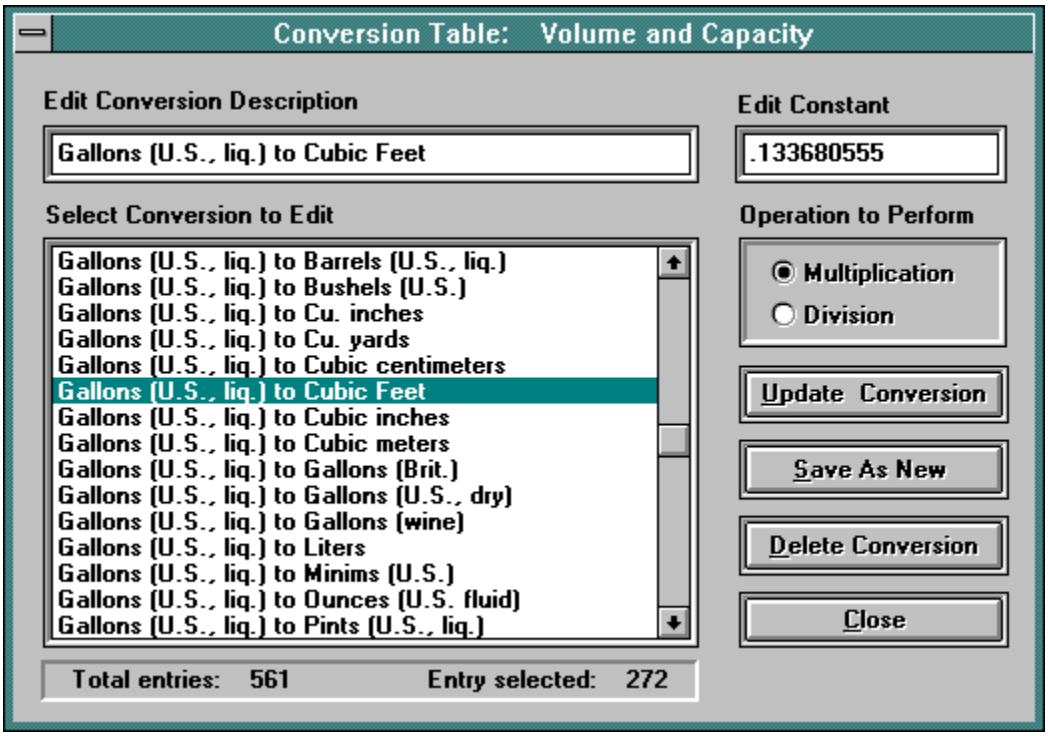
Sample of customary and metric units for weight and mass.

Customary	Metric	Metric	Customary
1 grain	0.06479891 g	1 milligram	0.015432358 gr.
1 ounce	28.349523 g	1 centigram	0.15432358 gr.
1 pound	0.45359237 kg	1 gram	15.432358 gr.
1 ton	0.90718474 t	1 kilogram	2.2046226 lb.
		1 metric ton	2,204.6226 lb.

See category terms

Modifying Conversion Tables

Click the part of the Dialog Box you want to know more about.



See also Performing Conversions.

Enter in this location a conversion description that is unique and self explanatory of the conversion to be performed. This description is limited in size to the size of the text box entry area.

Select from this list box a Conversion Table Item to edit.

Click this button to update a previously selected Conversion Table Item.

Click this button to save a new a Conversion Table Item. Note that a table size is limited to 650 items.

Click this button to delete items from the Conversion Table List box.

Select the operation to be performed. This operator will be used to perform a conversion against the calculator main display and a constant value.

Enter the conversion constant here - it must be a valid numeric expression. This is the number that will be used in conjunction with the operator and the calculator display to compute a resultant value.

Clicking the close button will dismiss this dialog box and update the Conversion Table.

This area displays the size of the Conversion Table and the number of the selected entry being edited.

The window caption bar displays the Conversion Table category name.

Exiting Conversion Master

Conversion Master will automatically detect changes in calculator settings. Upon exiting the program, you will be prompted to update the Conversion Master initialization file. Changes detected are: Memory and Constant changes; changes in the conversion category usage (loading a different Conversion Tables); changes in modes (FIS, DEC & MET); changes in display accuracies (decimal and fractional); and changes in display viewing (hiding/unhiding alternate display).

Edit Menu

Main Display #1, Main Display #2, Conversion Table Resultant or Conversion Table Constant can be copied to the clipboard from the **Edit menu**. Also, any valid numeric expression can be pasted to the calculator.

Memory Menu

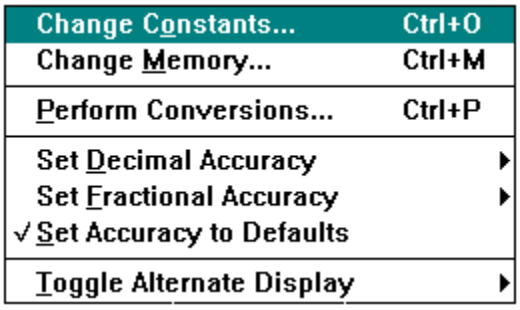
The Memory Menu is used to view and retrieve values that were previously stored in memory. This gives you the ability to view before retrieving. Optionally, the RCL key can be used to retrieve memory values provided the memory location of the desired value is known. These values are stored through the STO key or the use of Option menu item Change Memory. The Memory Menu selections can be used in the same manner as the RCL key when performing math functions. All values in memory are floating values i.e. they will be converted when the calculator mode is changed (See DEC, FIS, MET). Use the Constants Menu to access constant values. The last entered memory values will be retained when Conversion Master is exited.

Constants Menu

The Constants Menu item is used to view and retrieve values that were previously stored as constants. This gives the ability to view before retrieving. These values are stored through the use of Option menu item Change Constants. Math can be performed on the constant menu selections. These values are labeled constants because, unlike memory values, constants will not change when the calculator undergoes a mode change. Use the Memory Menu item to access floating values. Constants will be retained when Conversion Master is exited.

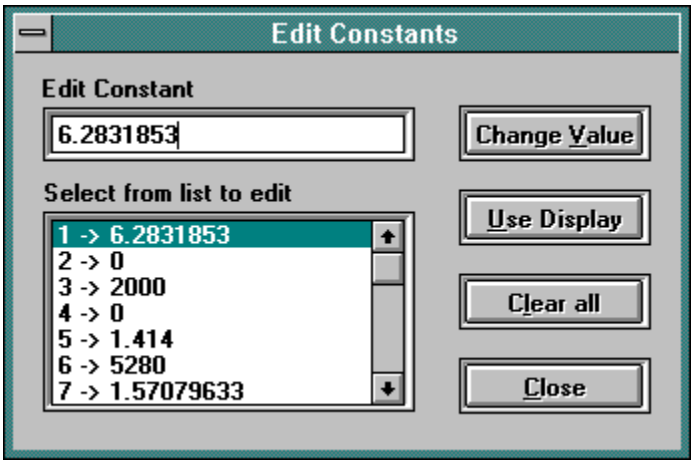
Options Menu

Click on the menu item you want to know more about.



Change/Edit Constants Locations

Click the part of the Dialog Box you want to know more about.



Constant Locations (1-9) can be changed by selecting from a list box of constant values to edit. The **Change Value** and **Use Display** buttons are disabled until a selection is made.

Click this text box when you want to change the value of a previously selected constant.

Select a constant location (from 1-9) to change from this list box.

Click this button to change a constant location to a new value.

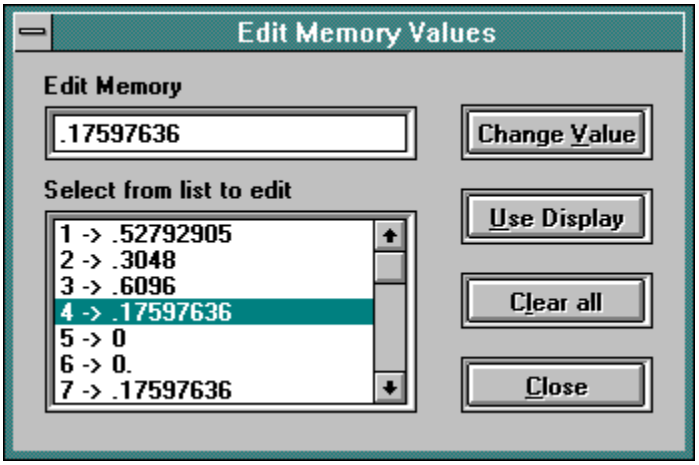
Click this button to use the Calculator display as the new constant value.

Click this button to set all constant locations to zero.

Click here to dismiss this dialog.

Change/Edit Memory Locations

Click the part of the Dialog Box you want to know more about.



Memory Locations (1-9) can be changed by selecting from a list box of memory values to edit. The **Change Value** and **Use Display** buttons are disabled until a selection is made.

Click this text box when you want to change the value of a previously selected memory location.

Select a memory location (from 1-9) to change from this list box.

Click this button to change a memory location to a new value.

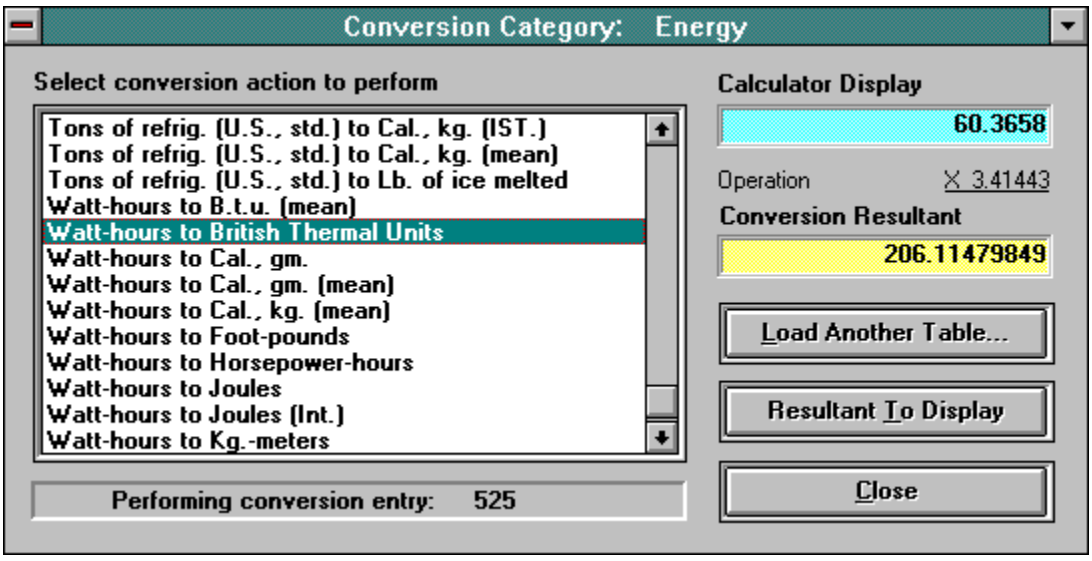
Click this button to use the Calculator display as the new memory value.

Click this button to set all memory locations to zero.

Click here to dismiss this dialog.

Perform Conversion

Click the part of the Dialog Box you want to know more about.



Conversion Tables allow you to do many different types of conversions by simply choosing from a list box the type of conversion to invoke. The resulting conversion can be placed in the calculator display if desired by clicking the **Resultant to Display** button. This dialog box is modeless i.e. it does not require user action before switching to another window. It can remain active in the background as new values are entered in the calculator. These values will be converted and then displayed in this dialog's Conversion Resultant display area as they are entered. See also Modifying Conversion Tables.

Click this list box to select a conversion to perform.

This area displays the value of the calculator main display. The calculator main display is the value which will be acted upon.

This is the operation and the constant value that will be performed against the calculator main display.

Clicking this button envokes a dialog box that enables the loading of another Conversion Table. See Loading Conversion Tables

This area displays the result of the conversion operation.

Click this button to force the resultant value to calculator main display.

Click here to dismiss this dialog box.

The window caption bar displays the Conversion Table category name.

This area displays the table entry number of the selected conversion being performed.

Set Accuracies

These options set the display accuracy. They allow for the setting of **fractional** accuracies from 16ths to 128ths and **decimal** accuracies from 4 to 13 places. Default settings are considered to be 16ths In the FIS mode and 8 decimal places in DEC and MET modes. When exiting Conversion Master, new settings can be retained when initialization file is updated.

Toggle Alternate Display

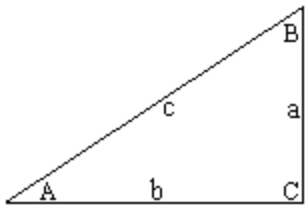
This option allows the user to turn off the second display when its information is not relevant. Note that there are two conditions that will automatically activate the second display:

- When the calculator has solved a right triangle using the BEV, RUN, RIS or SLP keys.
- When the calculator is In the FIS mode.

Help Menu

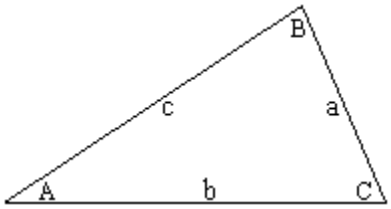
The Help menu invokes various aspects of this help system and the program's About Dialog box.

Formulas for solving Right Trianlges



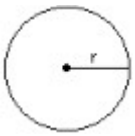
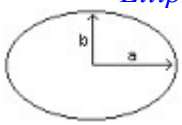
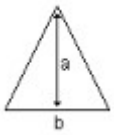
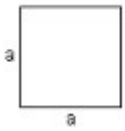
Known	Required angle or side A	B	a	b	c	Area
a,b						
a,c						
A,a						
A,b						
A,c						

Formulas for solving Oblique Trianlges

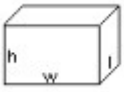


Known	Required angle or side A	B	C	b
a,b,c				
a,A,B				
a,b,A				
a,b,C				

Formulas for Plane figures

Plane Figures	Area
Circle 	area = πr^2 circumference = $2\pi r$
Ellipse 	area = πab
Triangle 	area = $\frac{1}{2}ab$
Square 	area = a^2
Rectangle 	area = lw

Formulas for Shaped figures

Shape	(Surface) Area	Volume
Rectangular Prism 		l + w ´ h

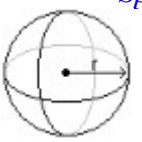
2hw

+ 2hl + 2lw

Cube

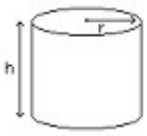
$6a^2$ a^3

Sphere



$4\pi r^2$ $\frac{4}{3}\pi r^3$

Cylinder



$2\pi rh + 2\pi r^2$ $\pi r^2 h$

Cone

$\pi\sqrt{r^2 + h^2}$ $\frac{\pi r^2 h}{3}$

(

$+\pi r^2$ if you add the base)