USER'S GUIDE

PIPE TRADES PRO™

Advanced Pipe Trades Math Calculator

Model 4095

CALCULATED INDUSTRIES®

FAST. ACCURATE. RELIABLE.

Designing and building new calculators like the Pipe Trades Pro™ Advanced Pipe Trades Math Calculator and the PlumbingCalc™ Pro Flow & Dimensional Math Calculator could not have been done without the support of pipefitting and plumbing professionals. Calculated Industries gratefully acknowledges the many individuals and organizations who were so generous with their time and expertise.

- *United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada*
    - *David Kendrick, Secretary-Business Manager, Greater Kansas City Building and Construction Trades Council, AFL-CIO*
    - *Sprinkler Fitters Local 314*
    - *Plumber & Gas Fitters Local 8*
    - *Pipe Fitters Local 533*
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- *Pete Nicacio, Training Coordinator, Plumbers & Steamfitters 598*
- *John Williams, Plumbing Technology Instructor, Kirkwood Community College*
- *Pipe Fitters Local 350*

PIPE TRADES PRO™

The Pipe Trades Pro™ Advanced Pipe Trades Math Calculator has been specifically designed for today's pipe trade professionals. No matter what Pipe Trade you work in, you'll find it easy to use, fast, accurate, and reliable. Quickly calculate Offsets, Rolling Offsets, and Cutbacks. Immediately access Pipe Material and Type data, and Pipe Size dimensions. The Pipe Trades Pro will help you on the jobsite or in the office.

- *Built-in data and Pipe Sizing for 7 different Piping Materials*
- *Linear and Rolling Offset Solutions*
- *Cutback Solutions*
- *Trigonometric Solutions*
- *Circle, Circumference and Area Solutions*
- *Fractional Feet-Inch Input/Output*
- *Simple US/Metric and Flow Conversions and Solutions*
- *Problems Involving All Architectural Fractions — 1/2-1/64ths*
- *And more*

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GETTING STARTED

You may want to practice getting a feel for your calculator keys by reading through the key definitions and learning how to enter basic feet-inch-fractions and metric, how to store values in Memory, etc., before proceeding to the examples.

Order of Operations

Unlike other Calculated Industries calculators, which use the Chaining Method of Operations, this calculator uses the Order of Operation Method.

- Chaining Method ("as entered"): 10 + 4 x 5 = 70
- Order of Operations: 10 + 4 x 5 = 30

The Order of Operations method of computing is based on the following order of precedence:

1) Expressions inside of parentheses
2) Single-variable functions that perform the calculation and display the result immediately (trig functions, square, square root, x^y, percent, reciprocal, angle conversions)
3) Multiplication and division
4) Addition and subtraction
5) Equals (completes all operations)

If you need to calculate using the Chaining Method, you can change this in your calculator Preference Settings.

Using Parentheses

Your calculator has parentheses keys (and) for performing mathematical operations. (In the Order of Operations method, expressions inside of parentheses are performed first.)

The calculator offers up to 21 levels of parenthesis:

1) First parenthesis level opened – press (for one right-sided parenthesis.

2) Second level opened – press (a second time for two right-sided parentheses ((.

3) Third level opened – press (a third time for three right-sided parentheses (((.

4) Fourth level opened – press (a fourth time for four right-sided parentheses ((((.

Numbers of levels greater than four are shown in the upper left corner of the display.

KEY DEFINITIONS

Basic Function Keys

On/C — ***On/Clear Key –*** *Turns on power. Pressing once clears the last entry and the display. Pressing twice clears all non-permanent values.*

Off — ***Off –*** Turns all power off. Clears all non-permanent memory.

+ − × ÷ = — ***Arithmetic operation keys***

0 – 9 and • — ***Keys used for entering numbers.***

Conv — ***Convert –*** Used with the dimensional keys to convert between units or with other keys to access special functions.

Stor — ***Store –*** Used for storing values.

Rcl — ***Recall –*** Used with other keys to recall stored values and settings.

Conv **Rcl** — ***Memory Clear (M-R/C) –*** Clears Memory without changing current display.

M+ ***Accumulative Memory –*** Adds value to Accumulative Memory.

Conv M+ ***(M-) –*** Subtracts value from Accumulative Memory.

Dimensional Function Keys

Feet ***Feet –*** Enters or converts to feet as whole or decimal numbers. Also used with Inch and / keys for entering feet-inch values (e.g., 6 Feet 9 Inch 1 / 2). *Repeated presses during conversions toggle between fractional feet-inch and decimal feet.*

Inch ***Inch –*** Enters or converts to inches. Entry can be whole or decimal numbers. Also used with / for entering fractional inch values (e.g., 9 Inch 1 / 2). *Repeated presses during conversions toggle between fractional and decimal inches.*

/ ***Fraction Bar –*** Used to enter fractions. Fractions can be entered as proper (1/2, 1/8, 1/16) or improper (3/2, 9/8). If the denominator (bottom) is not entered, the calculator's fractional accuracy setting is automatically used. Results are always shown in typical building fractional format.

Conv 1 Identifies/Converts to gallons per minute (GPM)

Conv 2 Identifies/Converts to liters per second (l/s)

Conv 4 Identifies/Converts to cubic feet per minute (CFM)

Conv 5 Identifies/Converts to cubic feet per second (CFS)

Conv 3 Identifies/Converts to ºC

Conv 6 Identifies/Converts to ºF

m ***Meters –*** Enters or converts to meters.

Conv m ***Millimeters –*** Enters or converts to millimeters.

Conv 8 ***Gallons –*** Enters or converts to gallons.

Conv 9 ***Liters –*** Enters or converts to liters.

Weight/Volume Functions

Conv **/** ***Weight/Volume –*** *Stores a new weight volume as pounds per cubic feet or other format as shown below. Default value is 62.42796 pounds per cubic foot (1000 kG/m3).*

- LB per CU FEET
- LB Per CU INCH
- LB per GAL
- Kg PER CU M
- kG per liter

Conv **7** Pounds (lbs) – Enters or converts a weight or volume value to pounds.

Conv **•** ***Kilograms (kg) –*** Enters or converts a weight or volume value to kilograms.

Circle Key

Circle Enters diameter and calculates circle area and circumference.

Trigonometric Keys

Sine Finds the sine of a degree or undimensioned value.

Conv **Sine** ***Arcsine (sin^{-1}) –*** Gives the angle degrees for the Sine value.

Cos Finds the Cosine.

Conv **Cos** ***Arccosine (cos^{-1}) –*** Gives the angle in degrees for the Cosine value.

Tan Finds the Tangent.

Conv **Tan** ***Arctangent (tan^{-1}) –*** Gives the angle in degrees for the Tangent value.

Pipefitting Project Keys

Angle/ Slope Enters or calculates a linear Slope, Slope Angle or Percent Grade.

Conv Angle/ Slope	(%Grade) Used to enter or solve Percent Grade. Calculates Percent Grade based on entered Offset and Run or Slope.
Offset	Enters, calculates or stores the Offset (Rise).
Run	Enters or calculates the Run.
Travel	Enters or calculates the Travel (Diagonal).
Pipe Mat'l	Defines the Pipe Material. (Steel, Stainless Steel, Brass, Aluminum, Cast Iron, PVC or Copper).
Pipe Size	Enters the nominal Pipe Size and provides data pertaining to the entered size.
Conv Pipe Size	Defines the Pipe Type based on Pipe Material.
Conv Run	Calculates pipe Cutback after Bend Angle and Offset are entered.
Conv Travel	Calculates Rolling Offset pipe length.
Conv (	**(Flow)** Enter or calculate volumetric Flow Rate through a pipe.
Conv)	**(Velocity)** Enter or calculate Velocity and convert between feet per second, feet per minute, and meters per second.
Conv Circle	**(Pressure)** Enter Pressure value. Calculate Pressure loss. Convert between units of pressure.
Conv x^2	**(Force)** Enter or calculate Force and convert between lbf, newton.
Conv $\sqrt{x}$	**(Area)** Enter for pipe area for use in Flow, Velocity, Pressure, and Force calculations. Calculate Area given values for Flow/Velocity or Force/Area.

Miscellaneous Functions

(	Open parenthesis key
)	Close parenthesis key
x^y	Enters an exponential value other than x^2 or Square Root
Conv x^y	Enters the exponential root value ($x^{1/y}$)

Conv +	Displays value of π (3.141593)
Conv ÷	***(1/x) Reciprocal –*** Finds the reciprocal of a number (e.g., 8 Conv ÷ 0.125).
Conv −	(+/–) Toggle displayed value between minus and plus value
Conv ×	***Clear All –*** Returns all stored values to the default settings. (Does not affect Preference settings.)
x^2	Squares the value in the display
$\sqrt{x}$	Square root function
Conv 0	Cost function
Conv =	Paperless tape
Conv Stor	Preference settings
←	***Backspace Function –*** Used to delete entries one keystroke at a time (unlike the On/C function, which deletes the entire entry).
Conv ←	Percent function
Stor 1-9	Used to store values in Memory, registers 1-9

PREFERENCE SETTINGS

Press Conv, then Stor to access the Preferences menu. Continue pressing Stor to toggle through different Preferences. Press + or − keys to toggle between options of the different Preferences. Press On/C to exit Preferences. Your calculator will keep Preference settings until a Full Reset alters your settings to the default values.

KEYSTROKES	DISPLAY
Conv Stor	
(Fractional Resolution)	**FRAC 0 1/16 INCH**
+	**FRAC 0 1/32 INCH**
+	**FRAC 0 1/64 INCH**

➕	**FRAC 0 1/2 INCH**
➕	**FRAC 0 1/4 INCH**
➕	**FRAC 0 1/8 INCH**
➕ (repeats options)	**FRAC 0 1/16 INCH**

Second press of **Stor**:

(Area displays)	**AREA Std.**
➕	**AREA 0. SQ FEET**
➕	**AREA 0. SQ INCH**
➕	**AREA 0. SQ M**
➕ (repeats options)	**Std.**

Third press of **Stor**:

(Volume displays)	**VOL Std.**
➕	**VOL 0. CU FEET**
➕	**VOL 0. CU M**
➕ (repeats options)	**VOL Std.**

Fourth press of **Stor**:

(Meter Linear displays)	**METR 0.000 M**
➕ (floating point)	**METR FLOAt M**
➕ (repeats options)	**METR 0.000 M**

Fifth press of **Stor**:

(Decimal Degree displays)	**DEG 0.00º**
➕ (floating point)	**DEG FLOAt**
➕ (repeats options)	**DEG 0.00º**

Sixth press of **Stor**:

(Fractional mode)	**FRAC Std.**
➕	**FRAC COnSt.**
➕ (repeats options)	**FRAC Std.**

Seventh press of **Stor**:

(Mathematical Operation)	**MATH OrdEr**
➕	**MATH CHA1n**
➕ (repeats options)	**MATH OrdEr**

ENTERING DIMENSIONS

Linear Dimensions

When entering feet-inch values, enter dimensions from largest to smallest — feet before inches, inches before fractions. Enter fractions by entering the numerator (top number), pressing **/** (Fraction Bar key) and then the denominator (bottom number).
Note: *If a denominator is not entered, the fractional setting value is used.*
Examples of how linear dimensions are entered (press **On/C** after each entry):

DIMENSIONS	KEYSTROKES
5 feet	5 Feet
5 feet, 1 ½ inches	5 Feet 1 Inch 1 / 2
17.5 meters	1 7 • 5 m
1250 millimeters	1 2 5 0 Conv m

Square and Cubic Dimensions

Examples of how square and cubic dimensions are entered (press **On/C** after each entry):

DIMENSIONS	KEYSTROKES
14 square inches	1 4 Inch Inch
11 square feet	1 1 Feet Feet
3.3 square meters	3 • 3 m m
3 cubic feet	3 Feet Feet Feet

ENTERING CONVERSIONS

Linear Conversions

Convert 10 feet 6 inches to other dimensions, including metric:

KEYSTROKES	DISPLAY
1 0 Feet 6 Inch	10 FEET 6 INCH
Conv Feet *	10.5 FEET
Conv Inch *	126. INCH
m	3.200 M
Conv m (mm)	3200.4 MM

*Repeated presses of Feet or Inch will toggle between feet-inch-fractions and decimal feet or inches.

Volume Conversions

Enter 8.5 gallons and convert to liters.

KEYSTROKES	DISPLAY
On/C On/C	0.
8 • 5 Conv 8	GAL 8.5
Conv 9	LITR 32.176

Weight/Volume Conversions

Convert 20 pounds to kilograms:

KEYSTROKE	DISPLAY
On/C On/C	0.
2 0 Conv 7 (Pounds)	20 LB
Conv • (Kilograms)	9.071847 kG

Convert 5 cubic feet of water to pounds. Then convert the pounds to kilograms:

KEYSTROKE	DISPLAY
On/C On/C	0.
5 Feet Feet Feet	5 CU FEET
Conv 7 (Pounds)	312.1398 LB
Conv • (Kilograms)	141.5842 kG

Convert a cubic meter of concrete to pounds. The concrete weighs 111 lbs per cubic foot.

KEYSTROKE	DISPLAY
On/C On/C	**0.**
1 1 1 Conv / * (Wt/Vol)	**111 LB Per CU FEET**
1 m m m	**1 CU M**
Conv 7 (Pounds)	**3919.928 LB**
Conv ⊠	**ALL CLEARED**

**Restores default weight conversion to the weight of water (62.42796 lbs Per Cubic Foot)*

Temperature Conversions

Enter a temperature value, then Conv followed by 6 or 3 for Fahrenheit or Celsius, respectively.

Convert 78 °F to a °C temperature.

KEYSTROKES	DISPLAY
On/C On/C	**0.**
7 8 Conv 6 (°F)	**78 ºF**
Conv 3 (ºC)	**25.55556 ºC**

Convert 11 °C to a °F temperature.

KEYSTROKES	DISPLAY
On/C On/C	**0.**
1 1 Conv 3 (°C)	**11 ºC**
Conv 6 (ºF)	**51.8 ºF**

Flow Rate Conversions

You can enter a Flow value in cubic feet per second, liters per second, cubic feet per minute, or gallons per minute, then convert to other units. *Enter 47 cfs, then convert to other units.*

KEYSTROKES	DISPLAY
On/C On/C	0.
4 7 Conv 5 (cfs)	CFS 47
Conv 2 (l/s)	L/S 1330.892
Conv 4 (cfm)	CFM 2820.
Conv 1 (gpm)	GPM 21095.07

BASIC MATH OPERATIONS

Adding and Subtracting Strings of Dimensions

Add the following measurements:

- 6 feet 2-1/2 inches
- 11 feet 5-1/4 inches
- 18.25 inches

Then subtract 2-1/8 Inches.

KEYSTROKES	DISPLAY
6 Feet 2 Inch 1 / 2 +	
1 1 Feet 5 Inch 1 / 4 +	
1 8 • 2 5 Inch −	19 FEET 2 INCH
− 2 Inch 1 / 8 −	18 FEET 11-7/8 INCH

Multiplying Dimensions

Multiply 5 feet 3 inches by 11 feet 6-1/2 inches:

KEYSTROKES	DISPLAY
5 Feet 3 Inch × 1 1 Feet	
6 Inch 1 / 2 −	60.59375 SQ FEET

Dividing Dimensions

Divide 30 feet 4 inches by 7 inches:

KEYSTROKES	DISPLAY
3 0 Feet 4 Inch ÷ 7 Inch =	52.

Divide 20 feet 3 inches by 9:

KEYSTROKES	DISPLAY
2 0 Feet 3 Inch ÷ 9 =	2 FEET 3 INCH

PERCENTAGE CALCULATIONS

The Conv ← keys can be used for finding a given percent of a number or for working add-on, discount or division percentage calculations. It can be used with any type of number, in any dimension (feet, inch, millimeter, etc.) and any type of convention (non-dimensioned, linear, square or cubic).

Calculating Percentages

Find 18% of 500 feet:

KEYSTROKES	DISPLAY
On/C On/C	0.
5 0 0 Feet × 1 8	
Conv ←	90 FEET 0 INCH

Take 20% from 286 Feet 6 inches:

KEYSTROKES	DISPLAY
On/C On/C	0.
2 8 6 Feet 6 Inch − 2 0	
Conv ←	229 FEET 2 3/8 INCH

Add a 10% waste allowance to 275 feet of pipe:

KEYSTROKES	DISPLAY
On/C On/C	0.
2 7 5 Feet + 1 0 Conv ←	302 FEET 6 INCH

MEMORY OPERATION

Whenever the M+ key is pressed, the displayed value will be added to the Memory. Other memory functions:

FUNCTION	KEYSTROKES
Add to Memory	M+
Subtract from Memory	Conv M+
Recall total in Memory	Rcl M+
Display/Clear Memory	Rcl Rcl
Clear Memory	Conv Rcl

Memory is semi-permanent, clearing only when you:

1) turn off the calculator;
2) press Rcl Rcl;
3) press Conv Rcl;
4) press Conv ⊠ (Clear All).

When Memory is recalled (Rcl; M+), consecutive presses of M+ will display the calculated average and total count of the accumulated values.

Using M+

KEYSTROKES	DISPLAY
3 5 5 M+	M+ 355. M
2 5 5 M+	M+ 255. M
7 4 5 Conv M+ (M-)	M- 745. M
Rcl M+	TTL – 135. M
M+	AVG – 45. M
M+	CNT 3. M
Rcl Rcl	M+ – 135.

Using Memory Storage Keys (M1 - M9)

In addition to the standard cumulative Memory (as previously described), your calculator has nine independent Storage Registers – M1 through M9 – that can be used to permanently store single, noncumulative values. The following example shows the use of M1 (Stor 1). To use M2 - M9, replace the presses of the 1 key with presses of the corresponding number key (2 - 9).

You can replace a value in one of these Memory registers by storing a new value in place of the stored value.

FUNCTION	KEYSTROKES
Store single value in M1	Stor 1
Clear M1	0 Stor 1
Recall M1	Rcl 1

Example: *Store 175 into M1, recall the value, and then clear the value.*

KEYSTROKES	DISPLAY
1 7 5 Stor 1	M-1 175.
Off On/C	0.
Rcl 1	M-1 175.
0 Stor 1	M-1 0.

PAPERLESS TAPE

The Paperless Tape allows you to display and review the last 30 entries of a calculation. Conv = accesses the tape mode and + or − scrolls forward or backward through the entries. *Note: The Paperless Tape is cleared each time On/C is pressed twice, the unit is shut off, or an All Clear (Conv ×) is performed.*

Paperless Tape Function — Normal Mathematics

1. Enter a string of numbers:

KEYSTROKES	DISPLAY
On/C On/C	0.
4 Feet +	4 FEET 0 INCH
5 Feet +	9 FEET 0 INCH
6 Feet +	15 FEET 0 INCH
7 Feet −	22 FEET 0 INCH

2. Access the Tape function:

Conv −	TTL= 22 FEET 0 INCH

3. Scroll from first value and total:

+	01 4 FEET 0 INCH
+	02+ 5 FEET 0 INCH
+	03+ 6 FEET 0 INCH
+	04+ 7 FEET 0 INCH
+	TTL= 22 FEET 0 INCH

4. Scroll to last two values:

−	04+ 7 FEET 0 INCH
−	03+ 6 FEET 0 INCH

5. Exit Tape function and continue:

−*	TTL= 22 FEET 0 INCH
+	22 FEET 0 INCH
2 Feet −	24 FEET 0 INCH

**Displays total before exiting.*

CALCULATE COSTS

The Cost function provides the total cost for material, based on a stored unit cost and an entered quantity of material. This is convenient for quickly calculating costs on a job that requires many of the same kind of items.

Example: *You are doing an installation that includes 120 feet of pipe that comes in 10' lengths at $3.21 per 10' pipe.*

KEYSTROKES	DISPLAY
Store the unit cost of the pipes needed:	
On/C On/C	0.
3 • 2 1 Stor 0	COST Per 3.21
Enter the number required:	
1 2	12
Calculate total cost:	
Conv 0 *(Cost)*	TTL$ 38.52

You can then quickly calculate costs for a different number of the same item.

KEYSTROKES	DISPLAY
On/C On/C	0.
1 7	17.
Conv 0 *(Cost)*	TTL$ 54.57

You can also find costs of different items on the fly without overwriting your stored unit cost.

Determine the cost of 17 fittings at $2.89 each:

KEYSTROKES	DISPLAY
Enter number of pipes needed:	
On/C On/C	0.
1 7	17.
Multiply by the cost:	
× 2 • 8 9	2.89
Conv 0 *(Cost)*	TTL$ 49.13

USING THE PIPE TRADES PRO

Note: *The Pipe Trades Pro's built-in right-angle functions, including Offset, Run, and Travel, are designed to calculate centerline lengths only and do not account for take outs or welder's gaps.*

Pipe Material Key

The Pipe Material key lets you choose a pipe material, which defines the available sizes and surface roughness used by the calculator. See the Users Guide for more information. The default material for the Pipe Trades Pro is Steel, but the user can choose from material types as shown.

KEYSTROKES	DISPLAY
On/C On/C	0.
Pipe Mat'l (Steel)	MATL STEEL
Pipe Mat'l (Stainless Steel)	MATL S.STEEL
Pipe Mat'l (Brass)	MATL BRASS
Pipe Mat'l (Aluminum)	MATL AL
Pipe Mat'l (Cast Iron)	MATL CAST
Pipe Mat'l (Plastic)	MATL PLASTIC
Pipe Mat'l (Copper)	MATL COPPER

The last material setting displayed is selected, and the calculator will retain your setting even after the power has been turned off. Once a material is selected, you can easily toggle through the available types (Schedules, etc.) using the Pipe Type function (Conv Pipe Size). Available types of pipe are dependent upon the material setting.

Keystrokes below show the pipe types available for Plastic (press Pipe Mat'l until "PLASTIC" is shown in the display).

KEYSTROKES	DISPLAY
On/C On/C	0.
Rcl Pipe Mat'l	MATL PLASTIC
Conv Pipe Size (Schedule 40)	Type 40 PLASTIC
Pipe Size (Schedule 80)	Type 80 PLASTIC
Pipe Size (Schedule 120)	Type 120 PLASTIC
Pipe Size (SDR 21)	Type SD21 PLASTIC
Pipe Size (SDR 26)	Type SD26 PLASTIC
Pipe Size (SDR 32.5)	Type SD32 PLASTIC
Pipe Size (SDR 41)	Type SD41 PLASTIC

You can also directly enter a Pipe Type, e.g., Schedule 80, by entering a number corresponding to the pipe type.

KEYSTROKES	DISPLAY
On/C On/C	**0.**
Pipe Matl	**MATL PLASTIC**
8 0 Conv Pipe Size	**Type 80 PLASTIC**

Pipe Size Key

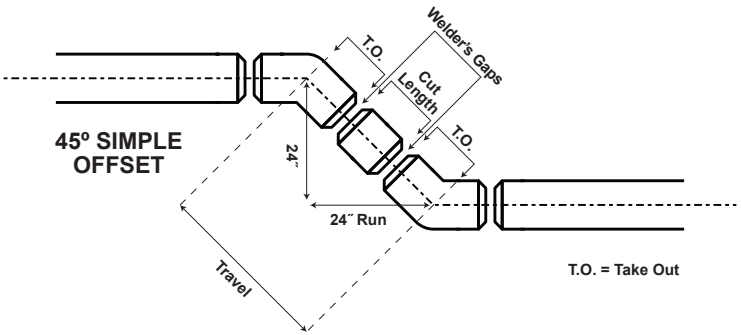
When you have chosen a Pipe Material and Type and then enter Pipe Size, the following data will be displayed.

For this example we are using 3" Steel, Schedule 80 pipe.

KEYSTROKES	DISPLAY
Conv ⊠	**0.**
1. Choose the Pipe Material:	
Pipe Matl	**MATL STEEL**
2. Enter the Pipe Type:	
8 0 Conv Pipe Size	**Type 80 STEEL**
3. Enter the Pipe Size:	
3 Inch	**3 INCH**
4. Toggle through the Pipe data:	
Pipe Size	**80 - SIZE 3 INCH**
Pipe Size (Outside Diameter)	**OD SIZE 3.5 INCH**
Pipe Size (Internal Diameter)	**ID SIZE 2.9 INCH**
Pipe Size (Wall Thickness)	**THK SIZE 0.3 INCH**
Pipe Size (Material)	**MATL SIZE STEEL**
Pipe Size (Weight per Foot)	**PIPE SIZE 10.2528 LB Per FEET**
Pipe Size (Filled Weight/Foot)	**FILL SIZE 13.11634 LB Per FEET**
Pipe Size (Internal Area)	**AREA SIZE 6.605199 SQ INCH**

Simple Offset

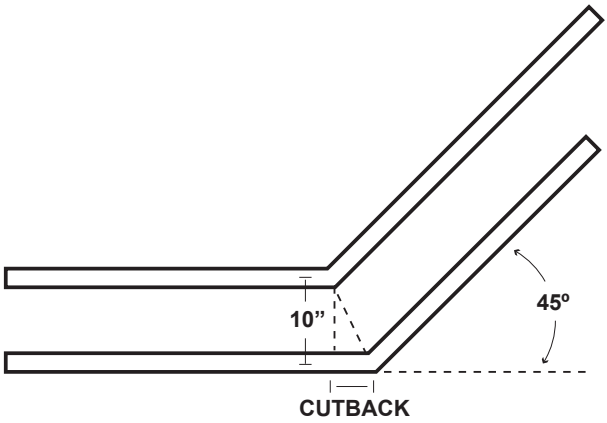
Find the cut length for a pipe that has a 24” Run and 45° simple offset. Example assumes a 6” 45° butt weld elbow and a welder’s gap of 3/32”.



KEYSTROKE	DISPLAY
On/C On/C	0.
1. Enter Run:	
2 4 Inch Run	RUN 24 INCH
2. Enter bend angle:	
4 5 Angle/ Slope	/0 45.00°
3. Find the Travel:	
Travel	33 15/16 INCH
4. Subtract 2 times the elbow take out (2 x 3 ¾”) from the calculated centerline Travel:	
− 2 × 3 Inch 3 / 4 =	26 7/16 INCH
5. Subtract 2 times the welder’s gap (2 x 3/32”):	
− 2 × 3 / 3 2 =	26 1/4 INCH

Concentric Pipe Bend Cutback

Find the pipe Cutback when you are running pipes through a 45º bend with a 10” offset.



KEYSTROKES	DISPLAY
On/C On/C	0.
1. Enter the bend angle: 4 5 Angle/ Slope	/0 45.00 º
2. Enter the Offset: 1 0 Inch Offset	OFST 10 INCH
3. Calculate the Cutback: Conv Run	CUT 4 1/8 INCH

Rolling Offset

The components of rolling offset calculations sometimes have different names in different geographic regions and in different trades.

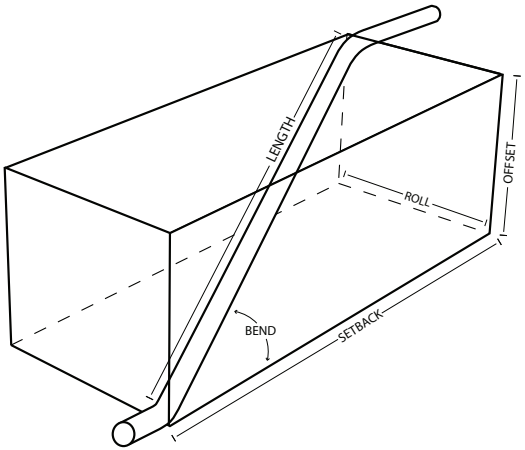
- Roll – the horizontal component of a rolling offset. May also be known as “offset”.
- Offset – the vertical component of a rolling offset. May also

be known as “rise” or “set”.

- Bend – the bend angle, also known as “fitting angle” or “angle of turn”.

Note: *If an angle is not entered, or if the angle is set to 0 degrees, the fitting angle is assumed to be 90º.*

Calculate Pipe Length for a Rolling Offset with a 4” Roll, 5” Offset and a 45º Fitting Angle.



KEYSTROKES	DISPLAY
On/C On/C	0.
1. Enter the Fitting Angle: 4 5 Angle/ Slope	/Ø 45.00 º
2. Enter the Offset (Height): 5 Inch Offset	OFST 5 INCH
3. Enter the roll distance and calculate the Pipe Length: 4 Inch Conv Travel	LNTH 9 1/16 INCH

Continue pressing the Travel key to view all related values.

Travel *(setback)*	**STBK 6-3/8 INCH**
Travel	**BEND 45.00 º**
Travel	**OFST 5 INCH**
Travel	**ROLL 4 INCH**

Calculating Drop

If a pipe Run requires 1/8” drop per foot for drainage, how much total drop is required for a 25’ Run?

KEYSTROKES	DISPLAY
On/C On/C	**0.**
1. Enter the Slope (Drop):	
1 / 8 Angle/ Slope	**SLP 0 1/8 INCH**
2. Calculate the total drop (Offset):	
2 5 Feet Run Offset	**OFST 0 FEET 3 - 1/8 INCH**

Find the slope of a pipe Run if it drops 6 inches over 50 feet. What is its Angle and Percent Grade?

KEYSTROKES	DISPLAY
On/C On/C	**0.**
1. Enter the Run:	
5 0 Feet Run	**RUN 50 FEET 0 INCH**
2. Enter the Offset:	
6 Inch Offset	**OFST 6 INCH**
3. Calculate the Percent Grade, Slope and Angle:	
Conv Angle/ Slope	**% GRD 1.**
Angle/ Slope	**GRD 0.01**
Angle/ Slope	**SLP 0 1/8 INCH**
Angle/ Slope	**/Ø 0.57º**

Calculating Flow Rate

If you know the Area and Velocity, you can calculate the Flow Rate. For this example, the velocity is 5 feet per second, and the Area is 1.8 square inches.

KEYSTROKES	DISPLAY
Conv ✕	ALL CLEArEd
1. Enter the Velocity:	
5 Conv) *(Velocity)*	FPS 5
2. Enter the Area:	
1 • 8 Inch Inch Conv √x *(Area)*	AREA 1.8 SQ INCH
3. Calculate Flow Rate (default is Gallons per Minute):	
Conv (*(Flow)*	GPM 28.05195
4. Convert to different units of flow rates:	
(*(Cubic Feet per Minute)*	CFM 3.75
(*(Cubic Feet per Second)*	CFS 0.0625
(*(Liters per Second)*	L/S 1.769803
(*(Cubic Meters per Second)*	M3/S 0.00177
(*(Gallons per Minute)*	GPM 28.05195

If you clear the display, you can recall the last Flow Rate shown.

KEYSTROKES	DISPLAY
On/C	0.
Rcl Conv (	GPM 28.05195

If you clear the calculator, you will only recall the last unit shown.

KEYSTROKES	DISPLAY
On/C On/C	0.
Rcl Conv (	GPM 0.

If you know the Flow Rate, you can convert to other dimensional units.

KEYSTROKES	DISPLAY
Conv ⊠	ALL CLEARED
5 Conv 1 *(Gallons per Minute)*	GPM 5
Conv 4 *(Cubic Feet per Minute)*	CFM 0.668403
Conv 5 *(Cubic Feet per Second)*	CFS 0.01114
Conv 2 *(Liters per Second)*	L/S 0.315451

Velocity

You can enter a known Velocity, calculate Velocity and convert between different units of Velocity.

If you know the Flow and Area, you can calculate Velocity and then convert to other Velocity units. The default is feet per second (FPS). For this example, we know that the Flow is 5 gallons per minute, and the Area is 1.8 square inches.

KEYSTROKES	DISPLAY
Conv ⊠	ALL CLEARED
1. Enter the Flow:	
5 Conv ((Flow)	GPM 5
2. Enter the Area:	
1 • 8 Inch Inch Conv √x (Area)	AREA 1.8 SQ INCH
3. Calculate Velocity:	
Conv) (feet per second)	FPS 0.891204
) (feet per minute)	FPM 53.47222
) (meters per second)	M/S 0.271639

If you clear the display, you can recall the last velocity shown.

KEYSTROKES	DISPLAY
On/C	0.
Rcl Conv)	M/S 0.271639

If you clear the calculator, you will only recall the last unit shown.

KEYSTROKES	DISPLAY
On/C On/C	0.
Rcl Conv)	M/S 0.

If you know the velocity, you can convert to other dimensional units.

KEYSTROKES	DISPLAY
Conv ⊠	ALL CLEARED
5 Conv)	FPS 5.
= Conv) (feet per second)	FPS 5.
) (feet per minute)	FPM 300.
) (meters per second)	M/S 1.524

Pressure Loss

If you know Flow/Velocity, Pipe Size and Length, you can calculate Pressure Loss. If no Run (Length) is entered, Pressure Loss per foot is calculated. For this example we will use the default Material, Steel. Calculate for 2" Pipe with a Flow Rate of 4 gallons per minute and then convert to different dimensional units.

KEYSTROKES	DISPLAY
Conv ⊠	ALL CLEARED
1. Enter the Pipe Size:	
2 Inch Pipe Size	STD SIZE 2 INCH
2. Enter the Area:	
Conv √x (Area)	AREA 3.355605 SQ INCH
3. Enter the Flow Rate:	
4 Conv (	GPM 4.
4. Calculate Pressure Loss:	

Conv Circle	PSI PER FEET 0.000205
Circle	REY 6120.09
Circle	PSF PER FEET 0.029469
Circle	inHG PER FEET 0.000417
Circle	HEAD PER FEET 0.000472
Circle	BAR PER FEET 0.000014
Circle	KPA PER FEET 0.001411
Circle	PSI PER FEET 0.000205

Using values above, add the Run (Length) to calculate the Pressure Loss over the length of the pipe.

KEYSTROKES	DISPLAY
5 0 Feet Run	RUN 50 FEET 0 INCH
Calculate Pressure Loss	
Conv Circle	PSI 0.010232
Circle	REY 6120.09
Circle	PSF 1.47346
Circle	inHG 0.020833
Circle	HEAD 0.023603
Circle	BAR 0.000705
Circle	KPA 0.07055
Circle	PSI 0.010232

You can also change the Flow Rate and recalculate the Pressure Loss.

KEYSTROKES	DISPLAY
4 0 Conv (	GPM 40.
Conv Circle	PSI 0.575408
Circle	REY 61200.9
Circle	PSF 82.85877
Circle	inHG 1.171543
Circle	HEAD 1.32727
Circle	BAR 0.039673
Circle	KPA 3.9673
Circle	PSI 0.575408

Pressure/Force

If you know the Force and Area, you can calculate Pressure and convert the solution to different units of Pressure. For this example the Force is 100 lbf and the Area is 2 square inches.

KEYSTROKES	DISPLAY
Conv ⊠	ALL CLEARED
1. Enter the Force:	
1 0 0 Conv x^2 (Force)	LBF 100.
2. Enter the Area:	
2 Inch Inch Conv $\sqrt{x}$ (Area)	AREA 2 SQ INCH
3. Calculate Pressure:	
Conv Circle	PSI 50.
Circle	PSF 7200.
Circle	inHG 101.801
Circle	HEAD 115.3329
Circle	BAR 3.447379
Circle	KPA 344.7379
Circle	PSI 50.

Area

If you know the Force and Pressure, you can calculate Area. For this example the Force is 85 lbf and the Pressure is 15 psi.

KEYSTROKES	DISPLAY
Conv ⊠	ALL CLEARED
1. Enter the Force:	
8 5 Conv x^2 (Force)	LBF 85.
2. Enter the Pressure:	
1 5 Conv Circle (Pressure)	PSI 15.
3. Calculate the Area:	
Conv $\sqrt{x}$ (Area)	AREA 5.666667 SQ INCH

Pipe Capacity

How many gallons of water will a 20' long 6" pipe hold?

KEYSTROKE	DISPLAY
On/C On/C	0.
1. Enter the Pipe Size:	
6 Inch Pipe Size	STD SIZE 6 INCH
2. Find the Area:	
Conv $\sqrt{x}$	AREA 28.89026 SQ INCH
3. Multiply by the Pipe length:	
× 2 0 Feet =	4.012536 CU FEET
4. Find the Pipe capacity:	
Conv 8	GAL 30.01586

Weight of Filled Pipe

Find the weight of a 10 foot length of 6 inch Type 5 stainless steel pipe filled with water:

KEYSTROKE	DISPLAY
On/C On/C	0.
1. Choose the Pipe Material:	
Pipe Mat'l Pipe Mat'l	MATL S.STEEL
2. Choose the Pipe Type:	
5 Conv Pipe Size	TYPE 5 S.STEEL
3. Choose the Pipe Size:	
6 Inch Pipe Size	5 SIZE 6 INCH
4. Find the weight of one foot of water-filled pipe:	
Pipe Size (6 times)	FILL SIZE 21.71418 LB Per FEET

5. Find the weight of the filled 10' length of pipe:

[×] [1] [0] [=] **217.1418 LB**

Find the weight of the same length of pipe filled, with ethanol (one gallon of ethanol weighs 6.59 lbs.) Do not clear previous keystrokes.

KEYSTROKE	DISPLAY
1. Enter the weight of one gallon of ethanol:	
[6] [•] [5] [9] [Conv] [/] [/] [/]	**LB/G 6.59**
2. Find weight of one foot of ethanol-filled pipe:	
[Pipe Size] (7 times)	**FILL SIZE 18.77419 LB Per FEET**
3. Find the weight of the filled 10' length of pipe:	
[×] [1] [0] [=]	**187.7419 LB**
[Conv] [×]	**ALL CLEARED**

(Restores default weight conversion to the weight of water—62.42796 lbs per cubic foot.)

Force

Given Pressure and Area, you can calculate Force and convert between newtons and pound-force. For this example the Pressure is 100 PSI and the Area is 2 square inches.

KEYSTROKES	DISPLAY
[Conv] [×]	**ALL CLEARED**
1. Enter Pressure and Area	
[1] [0] [0] [Conv] [Circle]	**PSI 100.**
[2] [Inch] [Inch] [Conv] [$\sqrt{x}$]	**AREA 2. SQ INCH**
2. Calculate Force	
[Conv] [x^2]	**LBF 200.**
[x^2]	**NEWT 889.6443**

Circle Area and Circumference

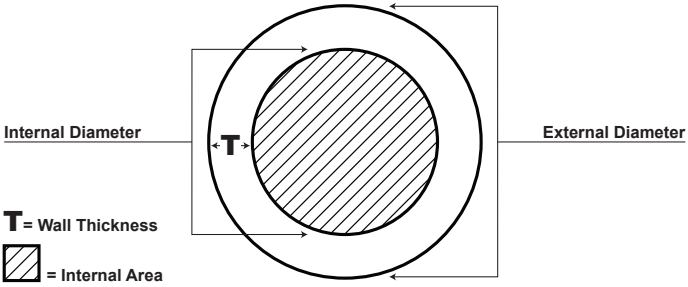
Find the area and circumference of a circle with a diameter of

25 Inches:

KEYSTROKES	DISPLAY
On/C On/C	0.
2 5 Inch Circle	DIA 25 INCH
Circle	AREA 490.8739 SQ INCH
Circle	CIRC 78-9/16 INCH

APPENDIX A – Pipe Material, Pipe Type And Data Tables

After selecting a Pipe material, you can select Pipe Types for that material and get data for each type, including Outside Diameter, Internal Diameter, Wall Thickness, Pipe Weight per Foot, Filled Weight per Foot, and Internal Area.



PIPE MATERIALS

Plastic, Copper, Steel, Stainless Steel, Brass, Aluminum and Cast Iron. The default is Steel. The calculator will recall the last material used. After a Clear All or Factory Reset, the default is displayed first.

PIPE TYPES FOR EACH MATERIAL

Stainless Steel

Schedules: 40-S, 80-S, 160, 5-S, 10-S

Plastic

Schedules: 40, 80, 120; SDR 21, SDR 26, SDR 32.5, SDR 41

Copper
Type L, Type K, Type M, Type DWV, Medical Type L, Medical Type K, ACR-Annealed, ACR-Drawn

Steel, Brass, Aluminum, Cast Iron
Schedules: Std, 40, 60; XS, 80, 100, 120, 140, 160; XSS, 10, 20, 30

APPENDIX B – Default Settings

After a Clear All (Conv ⊠), your calculator will return to the following settings:

Stored Values	Default Value
Material	STEEL
Pipe Type	Std
Weight to Volume	62.42796 LB Per CU FEET

If you replace your batteries or perform a Full Reset* (press [Off], hold down ⊠, and press On/C Off, your calculator will return to the following settings (in addition to those listed above):

Preference Settings	Default Value
Fractional Resolution	1/16
Area Display	Standard
Volume Display	Standard
Meter Linear Display	0.000
Decimal Degree Display	0.00°
Standard or Constant Fractional Resolution	Standard
Mathematical Operations	Order of Operations Method

**Depressing the Reset button located above the [Angle/Slope] key will also perform a Full Reset.*

APPENDIX C – Preference Settings

The PlumberCalc Pro has Preference Settings that allow you to customize or set desired dimensional formats and calculations.

If you replace your batteries or perform a Full Reset* (press **Off** hold down ⊠, and press **On/C**, your calculator will return to the following settings (in addition to those listed on the previous page):

Depressing the Reset button located above the **Angle/Slope will also perform a Full Reset. Asterisks below indicate default values.*

Preference	**Options**
1) Fractional Resolution	– ***1/16** (displays fractional values to the nearest 16th of an Inch) **– 1/32** **– 1/64** **– 1/2** **– 1/4** **– 1/8**
2) Area Display Format	– ***Standard** (if units entered are the same—e.g., Feet x Feet—the answer will remain in this format (Square Feet), but if units entered are different — e.g., Inches x Feet—area answer will be displayed in Square Feet) – **Square Feet** (area answers always displayed in Square Feet, regardless of unit entry — e.g., Inches x Inches = Square Feet) – **Square Inches** (area answers always displayed in Square Inches — e.g., Feet x Feet = Square Inches) – **Square Meters** (area answers always displayed in Square Meters — e.g., Feet x Feet = Square Meters)
3) Volume Display Format	– ***Standard** (if units entered are the same — e.g., Feet x Feet x Feet — the answer will remain in this format (cu. ft), but if units entered are different — e.g., Feet x Feet x Inches — vol. answer will always be displayed in Cubic Feet)

– **Cubic Feet** (vol. answers always displayed in Cubic Feet, regardless of unit entry — e.g., Inches x Inches x Inches = Cubic Feet)

– **Cubic Meters** (vol. answers always displayed in Cubic Meters, regardless of unit entry — e.g., Feet x Feet x Feet = Cubic Meters)

4) Meter Linear Display – ***0.000** (linear Meter answers are always displayed to third decimal place)

– **FLOAt** (linear Meter answers are displayed to the maximum number of decimal places — e.g., 1.2345 M + 2.56 M = 3.7945 M)

5) Decimal Degree Display – ***0.00°**

– **FLOAt**

6) Fractional Mode – ***Standard** (fractions are displayed to the nearest fraction)

– **Constant** (fractions are displayed in the set fractional resolution)

Note: To check the current Fractional Resolution, press [Rcl] [/]. Either "Std" (standard fractional resolution) or "Cnst" (constant) will be displayed, along with the fractional resolution).

7) Mathematical Operation – ***Order** (the calculator uses the Order of Operation Method (10 + 4 x 5 = 30)

– **Chain** (the calculator uses the Chaining Method of Operations (as entered: 10 + 4 x 5 = 70)

HOW TO SET PREFERENCES

The following sections detail Preference Setting options for the PlumbingCalc Pro calculator.

Enter the Preference Mode by pressing Conv Stor (Prefs). Access each category by pressing the Stor key until you reach the desired setting. Within each category, press the + or − keys to toggle between individual selections. Press On/C to exit and set your Preference.

Note: Press + to advance and press − to back up. Pressing the Stor key continuously in this mode will cycle through all of the Preference Settings.

You may change these settings at any time by repeating the above, and setting in a new preference.

To reset preferences back to factory default settings, turn your calculator off, hold down the × key and turn the calculator back on.

For example, if you wish to display all your dimensional area answers in square meters, press Conv Stor Stor (Area Std), then the + key until **"AREA 0. SQ M"** is displayed. Simply exit this mode by pressing On/C and all your future area answers will be displayed in square meters.

KEYSTROKES	**DISPLAY**
Conv Stor	
(Fractional Resolution)	**FRAC 0 1/16 INCH**
+	**FRAC 0 1/32 INCH**
+	**FRAC 0 1/64 INCH**
+	**FRAC 0 1/2 INCH**
+	**FRAC 0 1/4 INCH**
+	**FRAC 0 1/8 INCH**
+ (repeats options)	**FRAC 0 1/16 INCH**
Second press of Stor:	
(Area displays)	**AREA Std.**
+	**AREA 0. SQ FEET**
+	**AREA 0. SQ INCH**
+	**AREA 0. SQ M**
+ (repeats options)	**Std.**

Third press of Stor:

(Volume displays)	**VOL Std.**
⊕	**VOL 0. CU FEET**
⊕	**VOL 0. CU M**
⊕ (repeats options)	**VOL Std.**

Fourth press of Stor:

(Meter Linear displays)	**METR 0.000 M**
⊕ (floating point)	**METR FLOAt M**
⊕ (repeats options)	**METR 0.000 M**

Fifth press of Stor:

(Decimal Degree displays)	**DEG 0.00º**
⊕ (floating point)	**DEG FLOAt**
⊕ (repeats options)	**DEG 0.00º**

Sixth press of Stor:

(Fractional mode)	**FRAC Std.**
⊕	**FRAC COnSt.**
⊕ (repeats options)	**FRAC Std.**

Seventh press of Stor:

(Mathematical Operation)	**MATH OrdEr**
⊕	**MATH CHA1n**
⊕ (repeats options)	**MATH OrdEr**

APPENDIX D – Constants

For material surface roughness, we use the following:

Material	Roughness Factor e (x 10^{-6} ft)
PVC	15.6
Copper	4.9
Steel (low carbon)	221
Stainless Steel (austenitic)	49.2
Brass	4.9
Aluminum	4.9
Cast Iron	850

For water properties:
Viscosity = 0.001 Pascal-seconds
Density = 1000 kg/m³

Depending upon flow type and Reynolds Number value, we use one of the following methods for computing Pressure Loss:

1) Laminar Flow method (if Reynolds Number < 3,000)
2) Smooth Pipe method (if Reynolds Number > 3,000 and Boundary Layer Thickness < Pipe Roughness)
3) Prandtl equation method (if Reynolds Number < 100,000 and Pipe Roughness > Boundary Layer Thickness)
4) Karman Equation method (all other conditions)

APPENDIX E – Care Instructions

Please follow the guidelines listed in this section for proper care and operation of your calculator. Not following the instructions listed below may result in damage not covered by your warranty. Refer to the Repair and Return section on page 44 for more details.

Do not expose calculator to temperatures outside the operating temperature range of 32ºF – 104ºF (0ºC – 40ºC).

Do not expose calculator to high moisture such as submersion in water, heavy rain, etc.

APPENDIX F – Accuracy/Errors, Auto Shut-Off, Batteries, Reset

ACCURACY/ERRORS

Accuracy/Display Capacity — Your calculator has a twelve-digit display made up of eight digits (normal display) and four fractional digits. You may enter or calculate values up to 19,999,999.99. Each calculation is carried out internally to twelve digits.

Errors — When an incorrect entry is made, or the answer is beyond the range of the calculator, it will display the word "**ERROR**." To clear an error condition you must hit the **On/C** button once. At this point you must determine what caused the error and re-key the problem.

ERROR CODES

DISPLAY	ERROR TYPE
OFLO	Overflow (too large)
MATH Error	Divide by 0
DIM Error	Dimension error
ENT Error	Invalid entry error

Auto-Range — If an "overflow" is created because of an input and calculation with small units that are out of the standard seven-digit range of the display, the answer will be automatically expressed in the next larger units (instead of showing "**ERROR**") — e.g., 20,000,000 mm is shown as 20,000 m. Also applies to inches and feet.

AUTO SHUT-OFF

Your calculator is designed to shut itself off after about 8-12 minutes of non-use.

BATTERIES

The Pipe Trades Pro uses two LR-44 batteries.

Replacing Batteries

Should your calculator display become very dim or erratic, replace the batteries.

Note: Please use caution when disposing of your old battery, as it contains hazardous chemicals.

Replacement batteries are available at most discount or electronics stores. You may also call Calculated Industries at **1-775-885-4900**.

Battery Replacement Instructions

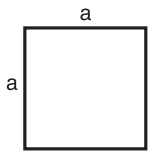
To replace the batteries, slide open the battery door (at top backside of unit) and replace with new batteries. Make sure the batteries are facing positive side up.

RESET

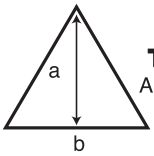
If your calculator should ever “lock up”, insert the tip of a paperclip into the small Reset hole located above the Angle/Slope key – to perform a total reset.

APPENDIX G – Formulas

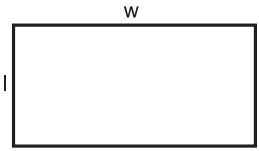
AREA FORMULAS



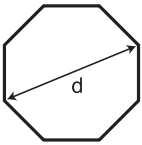
Square
Area = a^2



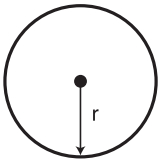
Triangle
Area = 1/2 ab



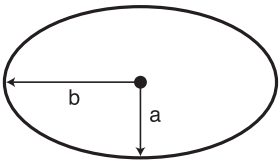
Rectangle
Area = lw



Octagon
Area = $(d/2)^2$ x 2.828

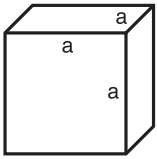


Circle
Circumference = $2\pi r$
Area = πr^2

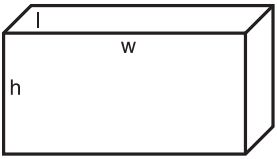


Ellipse
Area = πab

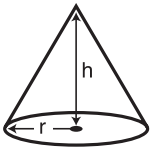
SURFACE AREA/VOLUME FORMULAS



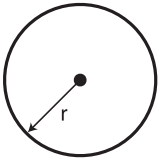
Cube
Surface Area = $6a^2$
Volume = a^3



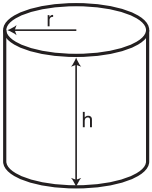
Rectangle
Surface Area =
$2hw + 2hl + 2lw$
Volume = l x w x h



Cone
Surface Area = $\pi r \sqrt{r^2 + h^2}$
($+ \pi r^2$ if you add the base)
Volume = $\frac{\pi r^2 h}{3}$



Sphere
Surface Area = $4\pi r^2$
Volume = $4/3\pi r^3$



Cylinder
Surface Area = $2\pi rh + 2\pi r^2$
Volume = $\pi r^2 h$

WARRANTY, REPAIR AND RETURN INFORMATION

Return Guidelines

1. Please read the ***Warranty*** in this User's Guide to determine if your Calculated Industries product remains under warranty **before** calling or returning any device for evaluation or repairs.
2. If your product won't turn on, check the batteries as outlined in the User's Guide.
3. If you need more assistance, please go to the website listed below.
4. If you believe you need to return your product, please call a Calculated Industries representative between the hours of 8:00am to 4:00pm Pacific Time for additional information and a Return Merchandise Authorization (RMA).

Call Toll Free: 1-800-854-8075

Outside USA: 1-775-885-4900

www.calculated.com/warranty

WARRANTY

Warranty Repair Service – U.S.A.

Calculated Industries ("CI") warrants this product against defects in materials and workmanship for a period of **one (1) year from the date of original consumer purchase in the U.S.** If a defect exists during the warranty period, CI at its option will either repair (using new or remanufactured parts) or replace (with a new or remanufactured calculator) the product at no charge.

THE WARRANTY **WILL NOT APPLY** TO THE PRODUCT IF IT HAS BEEN DAMAGED BY MISUSE, ALTERATION, ACCIDENT, IMPROPER HANDLING OR OPERATION, OR IF UNAUTHORIZED REPAIRS ARE ATTEMPTED OR MADE. SOME EXAMPLES OF DAMAGES NOT COVERED BY WARRANTY INCLUDE, BUT ARE NOT LIMITED TO, BATTERY LEAKAGE, BENDING, A BLACK "INK SPOT" OR VISIBLE CRACKING OF THE LCD, WHICH ARE PRESUMED TO BE

DAMAGES RESULTING FROM MISUSE OR ABUSE.
To obtain warranty service in the U.S., please go to the website.
A repaired or replacement product assumes the remaining warranty of the original product or 90 days, whichever is longer.

Non-Warranty Repair Service – U.S.A.

Non-warranty repair covers service beyond the warranty period, or service requested due to damage resulting from misuse or abuse. Contact Calculated Industries at the number listed above to obtain current product repair information and charges. Repairs are guaranteed for 90 days.

Repair Service – Outside the U.S.A.

To obtain warranty or non-warranty repair service for goods purchased outside the U.S., contact the dealer through which you initially purchased the product. If you cannot reasonably have the product repaired in your area, you may contact CI to obtain current product repair information and charges, including freight and duties.

Disclaimer

CI MAKES NO WARRANTY OR REPRESENTATION, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT'S QUALITY, PERFORMANCE, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. AS A RESULT, THIS PRODUCT, INCLUDING BUT NOT LIMITED TO, KEYSTROKE PROCEDURES, MATHEMATICAL ACCURACY AND PREPROGRAMMED MATERIAL, IS SOLD "AS IS," AND YOU THE PURCHASER ASSUME THE ENTIRE RISK AS TO ITS QUALITY AND PERFORMANCE.
IN NO EVENT WILL CI BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY DEFECT IN THE PRODUCT OR ITS DOCUMENTATION.
The warranty, disclaimer, and remedies set forth above are exclusive and replace all others, oral or written, expressed or implied. No CI dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty.
Some states do not allow the exclusion or limitation of implied warranties or liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights, and you may also have other rights, which vary from state to state.

FCC Class B

This equipment has been certified to comply with the limits for a Class B calculating device, pursuant to Subpart J of Part 15 of FCC rules.

Legal Notes

Looking For New Ideas

Calculated Industries, a leading manufacturer of special-function calculators and digital measuring instruments, is always looking for new product ideas in these areas.
If you have an idea, or a suggestion for improving this product or User's Guide, please submit your comments online at: www.calculated.com under "Contact Us", "Product Idea Submittal Agreement". Thank you.

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