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This program is intended to solve systems of equations involving trig functions with 1 or 2 unknown angles, but it will also handle other types of equations, such as exponential or logarithmic equations. It can also be used to solve fairly complex trig equations with one unknown. The program uses the TI Solve function, but is easier to use since there is no variable list to enter. Angle domains can be entered simply by choosing quadrants from a menu. Domain restrictions for linear variables, such as $x > 0$ and $y \geq 0$ and $y \leq 5$, can be entered. Calculations are done in radian mode, but results can be displayed in radians or degrees. Radian values are displayed in terms of π when possible. All entries can be edited. Solutions are copied to the Home screen and are stored under the variable names (x_1, θ_2, z_1,etc.).

Place SolvTrig(), Getnames(), Pi_rad(), Replace(), Rvrsmtrx(), and Copyto_h() in the same folder, then run SolvTrig().

Example 1.

Run SolvTrig()
2 equations
Equation 1

$$2\cos^2(\theta) - 3\sin\left(\frac{\alpha}{2}\right) = -\frac{1}{2}$$

Equation 2
$$2\sin^2(\theta) + 4\cos(\alpha) = 3$$

2 unknown angles
θ Angle 1 name
α Angle 2 name
Press ENTER, no linear domain limit
Choose angle 1 domain, 0 - 2π
Choose angle 2 domain, 0 - 2π
Solve
8 Solutions
Radians
Change angle mode
Degrees

Radians

$$\theta\_1 = \frac{\pi}{4} \qquad \theta\_5 = \frac{\pi}{4}$$
$$\alpha\_1 = \frac{5\pi}{3} \qquad \alpha\_5 = \frac{\pi}{3}$$
$$-----\qquad-----$$
$$\theta\_2 = \frac{3\pi}{4} \qquad \theta\_6 = \frac{3\pi}{4}$$
$$\alpha\_2 = \frac{5\pi}{3} \qquad \alpha\_6 = \frac{\pi}{3}$$
$$-----\qquad-----$$
$$\theta\_3 = \frac{5\pi}{4} \qquad \theta\_7 = \frac{5\pi}{4}$$
$$\alpha\_3 = \frac{5\pi}{3} \qquad \alpha\_7 = \frac{\pi}{3}$$
$$-----\qquad-----$$
$$\theta\_4 = \frac{7\pi}{4} \qquad \theta\_8 = \frac{7\pi}{4}$$
$$\alpha\_4 = \frac{5\pi}{3} \qquad \alpha\_8 = \frac{\pi}{3}$$

Degrees

$$\theta\_1 = 45. \qquad \theta\_5 = 45$$
$$\alpha\_1 = 300. \qquad \alpha\_5 = 60.$$
$$-----\qquad-----$$
$$\theta\_2 = 135. \qquad \theta\_6 = 135$$
$$\alpha\_2 = 300. \qquad \alpha\_6 = 60.$$
$$-----\qquad-----$$
$$\theta\_3 = 225. \qquad \theta\_7 = 225$$
$$\alpha\_3 = 300. \qquad \alpha\_7 = 60.$$
$$-----\qquad-----$$
$$\theta\_4 = 315. \qquad \theta\_8 = 315$$
$$\alpha\_4 = 300. \qquad \alpha\_8 = 60.$$

Example 2.

Run SolvTrig()
1 equation
Equation 1
$$\sin^2(2x) - \cos(x) = 0$$
Press ENTER, no linear domain limit
Choose angle 1 domain, 0 - 2π
Solve
4 Solutions
Radians

Radians

$$x\_1 = .57798$$
$$x\_2 = 1.2978$$
$$x\_3 = \frac{\pi}{2}$$
$$x\_4 = 5.7052$$

Degrees

$$x\_1 = 33.116$$
$$x\_2 = 74.36$$
$$x\_3 = 90.$$
$$x\_4 = 326.88$$

Example3.

Run SolvTrig()
3 equations
Equation 1
$t \cdot \cos(x) + 185 \cdot \cos(y) = 520$
Equation 2
$t \cdot \sin(x) - 185 \cdot \sin(y) = 0$
Equation 3
$185 \cdot \cos(y) = 160$
2 unknown angles
x Angle 1 name
y Angle 2 name
$t \geq 0$ linear domain limit
Choose angle 1 domain, 1st Quadrant
Choose angle 2 domain, 1st Quadrant
Solve
Degree mode
$t\_1 = 371.79$

$x\_1 = 14.465$

$y\_1 = 30.133$

Example 4.

Run SolvTrig()
3 equations
Equation 1
$2 \cdot \cos^2(x) + y + 4 \cdot \tan(z) = 8$
Equation 2
$\sin(x) + 2y - 2\sin(2z) = 4.5$
Equation 3
$\sin(x) - y + \tan(z) = -1.5$
2 unknown angles
x Angle 1 name
z Angle 2 name
Press ENTER, no linear domain limit
Choose angle 1 domain, 0 - 2π
Choose angle 2 domain, 0 - 2π
Solve
Degree mode
$x\_1 = 33.754$

$y\_1 = 2.968$

$z\_1 = 42.376$

Example 5.

Run SolvTrig()
1 equations
Equation 1
$$\left(1+\frac{0.065}{365}\right)^{365t} = 4$$
0 Unknown angles
Press ENTER
Solve
1 solution
$t\_1 = 21.33$

Example 6.

Run SolvTrig()
1 equations
Equation 1
$$\log(4x) - \log\left(12 + \sqrt{x}\right) = 2$$
0 Unknown angles
Press ENTER
Solve
1 solution
$x\_1 = 1146.5$