

# HP Prime – 1D Kinematics Solver



Select one, and only one, variable to solve for. (E.g.  $v_0$ )  
Enter three known values. (E.g.  $\Delta y$ ,  $v$ ,  $a$ )  
Select the function required. (E.g. function 4, as  $t$  variable is missing.)  
Select 'OK' to draw the graph.  
The function is left to the user to select.  
Use 'Symb Setup' button to set alternative units.

Key:

$\Delta x/y$  Change in x or y  
 $v_0$  Initial Velocity  
 $v$  Final Velocity  
 $a$  Acceleration  
 $t$  Time  
fn Selected formula

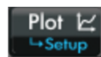
CRS 1D Kinematics Solver 10:19

$\Delta x/y$	5	1_m
$v_0$	0	1_(m/s)
$v$	0	1_(m/s)
$a$	-9.81	1_(m/s²)
$t$	0	1_s

fn 4.  $v^2 = v_0^2 + 2a\Delta x$  (t missing)

Choose function

Choose Cancel OK



The Plot screen shows the variables plus a simple graph with the direction, but not magnitude, of the variables.  
There is a reminder of how each variable was used:

✓ = input ✗ = unknown ⊕ = solved

Where two solutions exist both are shown numerically (and, potentially, with two arrows on the graph.)  
Cursor up and down keys can be used to highlight a variable.  
When a two answer solution is highlighted, new menu options appear to allow one of the two values to be chosen for subsequent calculations.

CRS 1D Kinematics Solver Plot 10:20

$\Delta y$	5_m	✓
$v_0$	[9.90454441153, -9.90454441153]	⊕
$v$	0_(m/s)	✓
$a$	-9.81_(m/s²)	✓
$t$	0_s	✗

Symb Rotate <-9.9 <-9.9 Close

On returning to the Symb screen the ticks on the right indicate which variables were used.

The user never has to set these check box, they are there for information only and always determined by the selected formula. They are updated once the Symb screen is returned to.

CRS 1D Kinematics Solver 10:53

$\Delta x/y$	5	1_m	✓
$v_0$	✓ [9.90454441153, -9.90454441153]	1_(m/s)	✓
$v$	0	1_(m/s)	✓
$a$	-9.81	1_(m/s²)	✓
$t$	0	1_s	✗

fn 4.  $v^2 = v_0^2 + 2a\Delta x$  (t missing)

Check to solve for  $\Delta x/y$

✓ Cancel OK

The selected value overwrites the  $v_0$  variable that previously held two solutions.

CRS 1D Kinematics Solver 10:28

$\Delta x/y$	5	1_m	✓
$v_0$	9.90454441153	1_(m/s)	✓
$v$	0	1_(m/s)	✓
$a$	-9.81	1_(m/s²)	✗
$t$	✓ 1.00963755469	1_s	✗

fn 2.  $\Delta x = ((v + v_0)/2)t$  (a missing)

Check to solve for  $\Delta x/y$

✓ Cancel OK

Note that the unknown variable, if previously entered, is still retained – but marked with a ✗.  
This is deliberate, as it may be of use for subsequent calculations.

CRS 1D Kinematics Solver Plot 10:28

$\Delta y$	5_m	✓
$v_0$	9.90454441153_(m/s)	✓
$v$	0_(m/s)	✓
$a$	-9.81_(m/s²)	✗
$t$	1.00963755469_s	⊕

Symb Rotate Close

The graph rotation has no bearing on the calculation it is simply to attempt to visualise the entered scenario.

CRS 1D Kinematics Solver Plot 10:28

$\Delta x$	5_m	✓
$v_0$	9.90454441153_(m/s)	✓
$v$	0_(m/s)	✓
$a$	-9.81_(m/s²)	✗
$t$	1.00963755469_s	⊕

Symb Rotate Close



SHIFT + Symb (Setup) allows units to be selected for distance and time. All variables use these common units. See 'Units' in system Help page for available units.  
Mixed distance or time units are not supported.

'Orient' sets the orientation of the graph. There are two orientations, vertical (+ = movement up) and horizontal (+ = movement right.) However, the graph can be toggled between the vertical and horizontal version using the 'Rotate' menu option on the 'Plot' screen.

'ADigits' sets the number precision.

CRS 1D Kinematics Solver Setup 10:29

Dist 1\_m

Time 1\_s

Orient 1. Down -ve / Up +ve

ADigits 8

Enter distance unit

Edit Cancel OK



CRS 1D Kinematics Solver 10:49

$\Delta x/y$	0	1_m
$v_0$	0	1_(m/s)
$v$	0	1_(m/s)
$a$	0	1_(m/s²)
$t$	0	1_s

fn 1.  $v = v_0 + at$  ( $\Delta x/y$  missing)

Check to solve for  $\Delta x/y$

✓ Cancel OK