

## Using a Table to Solve Equations

You can use the table feature to solve an equation. The problems with this method will be discussed later in this tutorial.

1. Let's solve  $-2x + 5 = 11$

Enter  $-2x + 5$  in Y1 (did you use the "negative" key not the "subtract" key?)

and

11 in Y2

Be sure Y1 and Y2 are highlighted.

```

Plot1 Plot2 Plot3
\Y1=-2X+5
\Y2=11
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
    
```

2. Now make a table with your choice of settings. Your first trial will likely look different than mine but we are just looking for a pattern at this point.

To solve the equation, we need to find the x-value that will make  $Y1 = Y2$ . I do not see this value in my table but I can guess which way to scroll. I will scroll up because Y1 is getting bigger in that direction.

X	Y1	Y2
0	5	11
1	3	11
2	1	11
3	-1	11
4	-3	11
5	-5	11
6	-7	11

X=0

3. You scroll until your window shows Y1 and Y2 both = 11.

$x = -3$  is the solution to the equation  $-2x + 5 = 11$ . You should check this by hand.

X	Y1	Y2
-5	15	11
-4	13	11
-3	11	11
-2	9	11
-1	7	11
0	5	11
1	3	11

X=-3

The problem with solving in tables is that you have to know how many solutions you are looking for and have some idea what these solutions are. Your Math class will help you with these issues.

4. Let's solve  $10x - 25 = 70$ . We'll do this one together.

Enter the left and right sides in Y1 and Y2. Hint: It really doesn't matter which one goes where.

```

Plot1 Plot2 Plot3
\Y1=10X-25
\Y2=70
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
    
```

5. Now make a table that starts at 0 and changes by 1.

```
TABLE SETUP
TblStart=0
ΔTbl=1
Indent: Ask
Depend: Auto Ask
```

We don't see our solution in this table so scroll down until Y1 is bigger than Y2.

X	Y1	Y2
0	-25	70
1	-15	70
2	-5	70
3	5	70
4	15	70
5	25	70
6	35	70

X=0

6. It looks like our solution is between 9 and 10, but is NOT an integer. So let's make the amount that x changes 0.1

You could change the TblStart value to 9 since we think the solution is between 9 and 10.

X	Y1	Y2
6	35	70
7	45	70
8	55	70
9	65	70
10	75	70
11	85	70
12	95	70

X=12

7. Now scroll through your table until you find the solution.

x = 9.5 is the solution to  $10x - 25 = 70$ .

X	Y1	Y2
9	65	70
9.1	66	70
9.2	67	70
9.3	68	70
9.4	69	70
9.5	70	70
9.6	71	70

X=9.5

We can also use tables to solve equations with variables on both sides.

8. Solve  $3(x + 5) - 2 = -2x + 7$   
Enter the left side in Y1 and the right side in Y2

```
Plot1 Plot2 Plot3
\Y1=3(X+5)-2
\Y2=-2X+7
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

9. Make a table starting at 0 and changing by 1.

Remember that to solve this equation we want to find the x-value that will make the two y-values the same.

It looks like the y-values get closer as we scroll up in the table.

X	Y <sub>1</sub>	Y <sub>2</sub>
0	13	7
1	16	5
2	19	3
3	22	1
4	25	-1
5	28	-3
6	31	-5

X=0

10. So scroll until you get the y-values as close as possible. They are closest when x = -1. Our solution must be near that but we're not quite sure which side of -1.

X	Y <sub>1</sub>	Y <sub>2</sub>
-3	4	13
-2	7	11
-1	10	9
0	13	7
1	16	5
2	19	3
3	22	1

X=-3

11. Change TblStart to -1 and ΔTbl to 0.1, make a table and scroll until you find the solution.

The solution is x = -1.2

X	Y <sub>1</sub>	Y <sub>2</sub>
-1.3	9.1	9.6
-1.2	9.4	9.4
-1.1	9.7	9.2
-1	10	9
-0.9	10.3	8.8
-0.8	10.6	8.6
-0.7	10.9	8.4

X=-1.2