

# Algebra II

## The 7 Methods

**Guess :**

In this method you cover the variable part of the equation and ask what needs to hold this place to make the sentence True. In:

$10 + \frac{2}{3}t = 6$  we cover the  $\frac{2}{3}t$  part and look at  $10 + \underline{\quad} = 6$ . This means that we

need  $\underline{\quad}$  to be - 4. This means that  $\frac{2}{3}t = -4$ . Repeating the process we need

to ask what number is needed in the following sentence:  $\frac{2}{3} * \frac{3 * \underline{\quad}}{1} = -4$ . So

we need a - 2 to get the - 4. So  $t = - 2 * 3$  or - 6.

**Solver :**

Press  $\left[ \frac{\square}{\square} \right]$  and move up or down (  $\uparrow$   $\downarrow$  ) to get to the 0:Solver... option on the MATH Menu. Press  $\left[ \text{ENTER} \right]$  to select and if the area is not clear, press  $\left[ \text{CLEAR} \right]$  to get a starting place.

```

MATH NUM CPX PRB
1:  $\frac{\square}{\square}$  Frac
2:  $\frac{\square}{\square}$  Dec
3:  $\square$ 
4:  $\sqrt{\square}$ 
5:  $\sqrt{\square}$ 
6: fMin(
7:  $\downarrow$  fMax(

```

```

MATH NUM CPX PRB
4:  $\sqrt{\square}$ 
5:  $\sqrt{\square}$ 
6: fMin(
7: fMax(
8: nDeriv(
9: fnInt(
0: Solver...

```

```

L*W-A=0
L=5
W=7
A=11
bound={-1E99,1...

```

```

EQUATION SOLVER
eqn: 0=

```

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For the sentence:  $-27 = 12w + 27$  we key in

```
EQUATION SOLVER
eqn: 0=(-27)-(12w
+27)
```

using parentheses for each side of the equation. Place a guess on the line for the variable. Then press  $f$  [SOLVE] to get the answer. Look for the bullet and don't forget to round.

```
(-27)-(12w+27)=0
w=7
bound=(-1E99,1...
```

```
(-27)-(12w+27)=0
▪ w=-4.5
bound=(-1E99,1...
▪ left-rt=0
```

### Graph Intersect:

Press  $\square$  and place the left side of the sentence on  $Y_1$  and the right side on  $Y_2$ . Using Bubble Baby and Dolciani [ $\square$  ,  $\square$  ] Look for the place where the two lines cross (intersect). You might have to adjust the Window to see the intersection. For this sentence  $0.7(5a - 1.2) = 2a - 0.39$  we replace the  $a$  with  $x$  and key in the following:

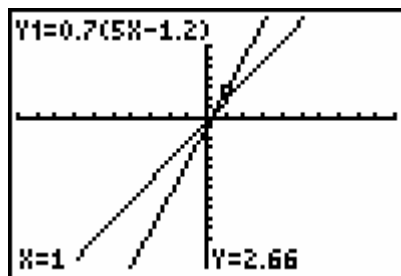
```
Plot1 Plot2 Plot3
0Y1=0.7(5X-1.2)
0Y2=2X-0.39
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

```
MEMORY
1:ZBox
2:Zoom In
3:Zoom Out
4:ZDecimal
5:ZSquare
6:ZStandard
7↓ZTrig
```

If you can  $\square$  and then guess the location, do that, but if you can't, press  $y$  [CALC] and find the actual intersection.

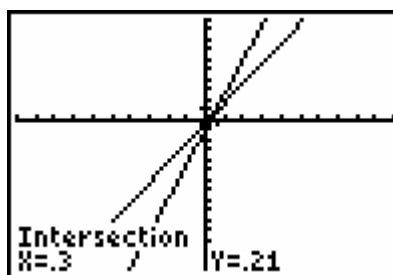
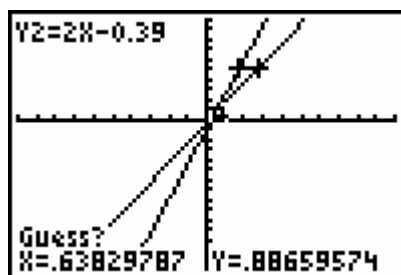
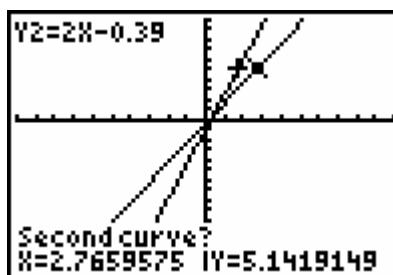
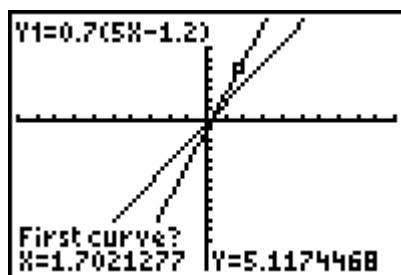
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```

GRAPHICS
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
    
```



### Substitution/Logic:

In this method, just place a value in for the variable and then key in the sentence using a colon to separate the two commands. Keep trying until you get the Truth (1). For  $78 = 22 - 8t$  we have:

```

9→T:78=22-8T
    
```

```

5→T:78=22-8T 0
-5→T:78=22-8T 0
-7→T:78=22-8T 0
    
```

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**Table:**

Start this method like the Intersection, but then you will set up your Table as shown below. Press  $y$  [TBLSET] and then  $y$  [TABLE] to see the Table. For the sentence  $4y - 21 = 9y - 16$  we have:

<pre> Plot1 Plot2 Plot3 →Y1 4X-21 →Y2 9X-16 \Y3= \Y4= \Y5= \Y6= \Y7=                 </pre>	<pre> TABLE SETUP TblStart=-10 ΔTbl=1 Indent:  Auto Ask Depend:  Auto Ask                 </pre>
---	--

Looking for the value of x that makes the two functions equal, we have:

<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr><th>X</th><th>Y1</th><th>Y2</th></tr> </thead> <tbody> <tr><td>-10</td><td>-61</td><td>-106</td></tr> <tr><td>-9</td><td>-57</td><td>-97</td></tr> <tr><td>-8</td><td>-53</td><td>-88</td></tr> <tr><td>-7</td><td>-49</td><td>-79</td></tr> <tr><td>-6</td><td>-45</td><td>-70</td></tr> <tr><td>-5</td><td>-41</td><td>-61</td></tr> <tr><td>-4</td><td>-37</td><td>-52</td></tr> </tbody> </table> <p>X = -10</p>	X	Y1	Y2	-10	-61	-106	-9	-57	-97	-8	-53	-88	-7	-49	-79	-6	-45	-70	-5	-41	-61	-4	-37	-52	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr><th>X</th><th>Y1</th><th>Y2</th></tr> </thead> <tbody> <tr><td>-7</td><td>-49</td><td>-79</td></tr> <tr><td>-6</td><td>-45</td><td>-70</td></tr> <tr><td>-5</td><td>-41</td><td>-61</td></tr> <tr><td>-4</td><td>-37</td><td>-52</td></tr> <tr><td>-3</td><td>-33</td><td>-43</td></tr> <tr><td>-2</td><td>-29</td><td>-34</td></tr> <tr><td>-1</td><td>-25</td><td>-25</td></tr> </tbody> </table> <p>X = -1</p>	X	Y1	Y2	-7	-49	-79	-6	-45	-70	-5	-41	-61	-4	-37	-52	-3	-33	-43	-2	-29	-34	-1	-25	-25
X	Y1	Y2																																															
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-1	-25	-25																																															

**By Hand:**

For the following sentence we will just do the traditional algebraic manipulation trying to get the variable isolated with a coefficient of 1.

$$5x - 7 = x + 9$$

$$5x - 7 - x = x + 9 - x$$

$$4x - 7 = 9$$

$$4x - 7 + 7 = 9 + 7$$

$$4x = 16$$

$$\frac{4x}{4} = \frac{16}{4}$$

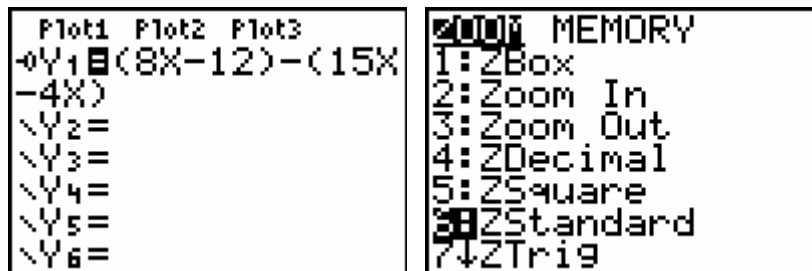
$$x = 4$$

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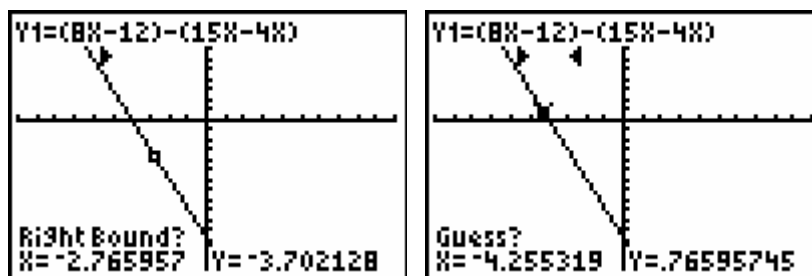
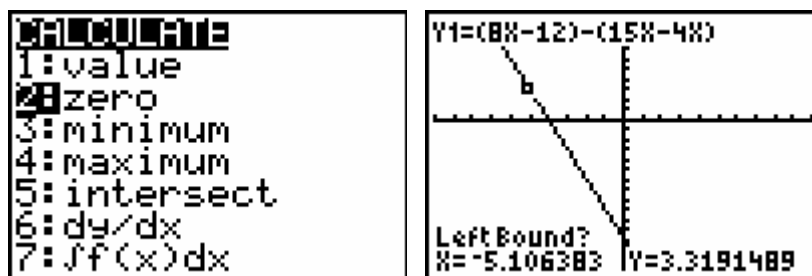
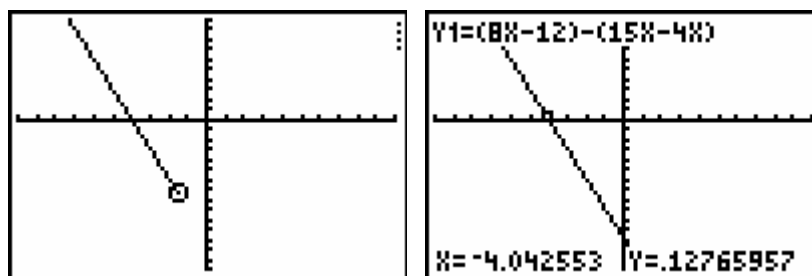
## The 7 Methods

### Zero:

This starts like Solver but on the O editor. For  $8x - 12 = 15x - 4x$  we have:



We are looking for the place where the line crosses the x-axis (where  $y = 0$ ). You can trace and guess the value, or use the Zero option off of the CALCULATE Menu (Press  $y$  [CALC]  $\overline{A}$ ).



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