

## Finding a Point of Intersection on the Calculator

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Example 1: Solve the following equation graphically  $3x - 2 = -5x + 8$

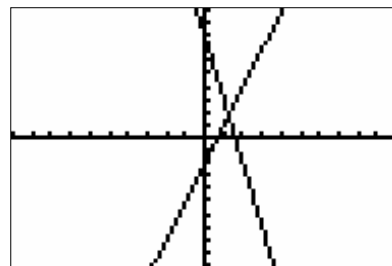
**Step1.** Press the  $\boxed{Y=}$  button and enter each side of the equation into the editor. In other words, Let  $\boxed{Y_1}$  equal the left side of the equation and let  $\boxed{Y_2}$  equal the right side of the equation

```
Plot1 Plot2 Plot3
\Y1=3X-2
\Y2=-5X+8
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

**Step2.** Graph the two equations by pressing  $\boxed{ZOOM}$  and the number 6 (ZStandard).

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

**Step3.** Adjust your window so that the intersection of the two equations is easily visible. The screen shown is the standard viewing window. You can manually adjust your window by choosing  $\boxed{WINDOW}$ , making the modifications, and pushing  $\boxed{GRAPH}$ .

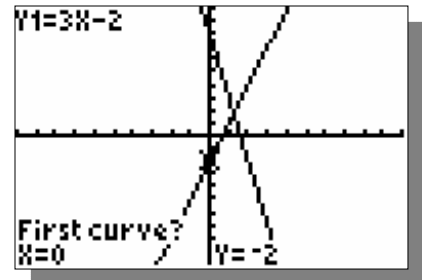


**Step4.** Now push  $\boxed{2^{nd}}$   $\boxed{TRACE}$  to access the  $\boxed{CALCULATE}$  menu. Choose option  $\boxed{\#5}$   $\boxed{INTERSECT}$ .

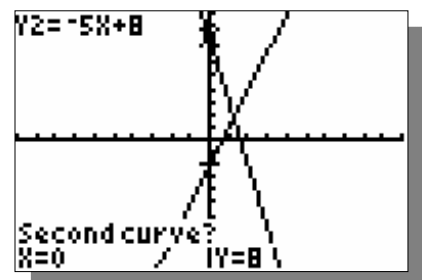
```
CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```

**Step5.** The calculator will now show the graphs of the two functions again.

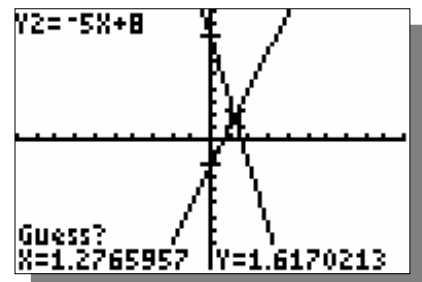
The cursor will be flashing on the first equation. At the bottom of the screen, the calculator will be asking you for the **FIRST CURVE?**. The calculator is asking you to choose the first *equation*. Press **ENTER**.



The cursor will now be flashing on the second equation. At the bottom of the screen, the calculator will be asking you for the **SECOND CURVE?**. Press **ENTER**.

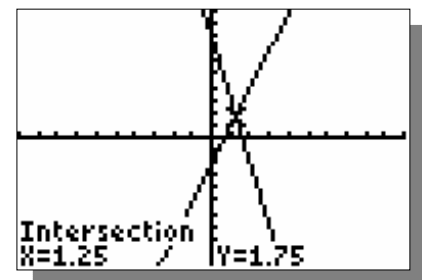


At the bottom of the screen, the calculator will be asking you to **GUESS?**. Using the arrow keys, move the cursor near the intersection point and press **ENTER**.



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**Step6.** The intersection point will be shown at the bottom of the screen. So the solution to  $3x-2=-5x+8$  is  $x=1.25$ .



**Note:** It is a good idea to verify your graphical solution by solving the linear equation symbolically as well.

Example 2: Solve the following equation graphically  $3x - 12 = 2x - 1$

Example 3: Solve the following inequality graphically  $3x - 12 > 2x - 1$

Example 4: Solve the following equation graphically  
 $0.3(z - 3) = 0.23 + 0.5(2z + 1)$

Example 5: Solve the following inequality graphically  
 $0.3(z - 3) \leq 0.23 + 0.5(2z + 1)$

Example 6: Solve the following equation graphically

$$3(t - 2) - 4t = 60 - (3 - t)$$

Example 7: Solve the following inequality graphically

$$3(t - 2) - 4t \geq 60 - (3 - t)$$

Example 8: Solve the following equation graphically

$$\frac{3(x - 2) + x}{2} = x + 3$$

Example 9: Solve the following inequality graphically

$$\frac{3(x - 2) + x}{2} < x + 3$$