

## 4.6 – Finding Intersections of Lines

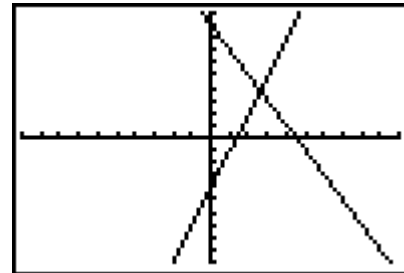
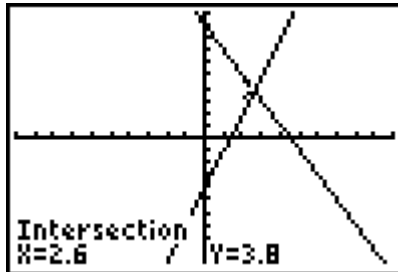
### 1. Solve the system: $y = -2x + 9$ and $y = 3x - 4$

1. Enter the first equation into **Y<sub>1</sub>**.
2. Enter the second equation into **Y<sub>2</sub>**.
3. Hit **GRAPH**.
4. Use the **INTERSECT** option to find where the two graphs intersect (the answer).  
**2nd TRACE (CALC) #5 intersect**  
 Move spider close to the intersection.  
 Hit **ENTER** 3 times.

```

Plot1 Plot2 Plot3
\Y1=-2X+9
\Y2=3X-4
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
  
```

5. **Answer:**  $x = 2.6$  and  $y = 3.8$



### 2. Solve the system: $x - 2y = 14$ and $x + 3y = 9$

The graphing calculator will only accept entries that start with  $y =$ , so we need to solve these equations for  $y =$ .

$$y = \frac{x}{2} - 7$$

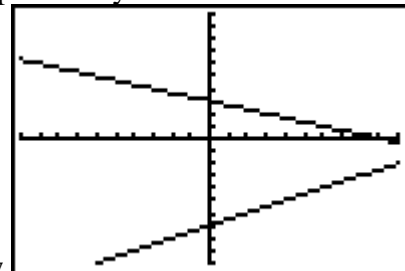
$$y = -\frac{x}{3} + 3$$

1. Enter the first equation into **Y<sub>1</sub>**.
2. Enter the second equation into **Y<sub>2</sub>**.
3. Hit **GRAPH**. The graphs appear to intersect OFF the window. We need MORE  $x$ -values to the right hand side of the graph. Go to **WINDOW**. Increase the size of **Xmax**. Hit **GRAPH**.

```

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

Oops!! They don't cross in the



window.

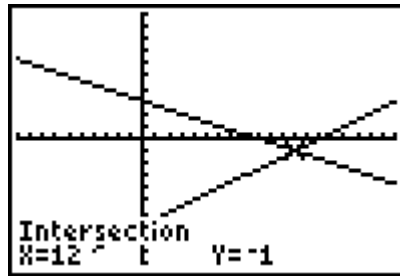
4. Use the **INTERSECT** option to find where the two graphs intersect (the answer).

**2nd TRACE (CALC) #5 intersect**

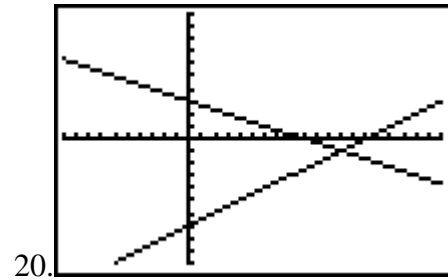
Move spider close to the intersection.

Hit **ENTER** 3 times.

5. **Answer:**  $x = 12$  and  $y = -1$



Better! Xmax was increased to



**Find the intersection(s) of graphs in coordinate form:**

If you converted any of your equations to "slope-intercept" form, write the work on this piece of paper.

1)  $x - y = 3$   
 $2x + y = 3$

2)  $4x + 3y = 8$   
 $3x + y = 0$

3)  $3x + y = -6$   
 $x + y = -4$

4)  $y = x$   
 $y = 6 - x$

5)  $y = -x + 2$   
 $y = 2x + 5$

6)  $4x + y = -3$   
 $5x - y = -6$

7)  $3x - 9y = 0$   
 $-x + 3y = -3$

8)  $3x + 5y = 15$   
 $x - y = 4$

\*\*9)  $y = x^2$   
 $y = 8 - x^2$

\*\*10)  $y = x^2 - 2x$   
 $y = -x^2 + 6x - 6$

